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CURTIS'S
BOTANICAL MAGAZINE,

ILLUSTRATING AND DESCRIBING

Plants of the Royal Botanic Gardens of Kew,

AND OF OTHER BOTANICAL ESTABLISHMENTS;

EDITED BY

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VOL. XI.
OF THE FOURTH SERIES.
(Or Vol. CXLI. of the Whole Work.)

"Flowers worthy of Paradise which not nice Art
In beds and curious knots, but Nature boon
Poured forth profuse."

MILTON.

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To

S. T. HEARD, Esquire,

IN WHOSE GARDEN

AT ROSSDOHAN, NEAR KENMARE,

SO MANY PLANTS

WHOSE PORTRAITS EMBELLISH THE

Botanical Magazine

FIND A CONGENIAL HOME,

THIS VOLUME

IS AFFECTIONATELY DEDICATED.

Kew, December 1, 1915.

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Tab. 8592, 8593.

ENCEPHALARTOS Hildebrandtii.

East Africa.

Cycadaceae. Tribe Encephalarteae.

Encephalartos, *Lehm.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 445.

Encephalartos Hildebrandtii, *A. Braun et Bouché, Ind. Sem. Hort. Berol.* (1874) p. 8; *A. Braun in Sitz. Ber. Gesellsch. Naturf. Freunde*, 1876, pp. 117–121; *Regel in Gartenfl.* 1876, p. 204 et 1877, p. 215; *Eichler in Monatschr. Ver. Beförd. Gartenbau*, 1880, vol. xxiii. p. 50; *Hennings in Gartenfl.* 1890, pp. 234–237, *Abbild.* 55, figs. 1, 4, 4*a*–*δ*; *Engler in Pflanzenw. Ost-Afr.* A, pp. 35, 78; B, p. 173; et C, p. 92; affinis *E. villoso*, Lehm., a quo recedit trunco magis elato, foliorum pinnis firmioribus pro longitudine latioribus plerumque supra spinis marginalibus longius attenuatis, praesertim vero strobili feminei structura, nempe squamarum vertice rhombico more conorum *Pini* specierum quarundam in apophysin excentricam elevato.

Arbor trunco cylindrico foliorum basibus persistentibus arctissime imbricatis obtecto humili vel ad 6 m. alto et 30 cm. diametro. *Folia* suberecta vel exteriora—in planta culta quidem—patentia, rigida, leniter recurva, ad 2·75 m. longa, 30 cm. lata, petiolo rhachique primo lanuginosis deinde glabratis postremo glaberrimis teretibus, pinnis utrinsecus 50–70 a basi ad medium accrescentibus intermediis oblique lineari-lanceolatis apice acutis spinescentibus ad 24 cm. longis 1·5–2·5 cm. latis utrinsecus spinis 4–1 (saepissime 3–2) armatis, spina summa plerumque ab apice remota, rigide coriaceis glaberrimis obscure parallele nervosis, pinnis inferioribus perbrevibus grosse spinoso-dentatis. *Strobilus* masculinus pedunculo ad 9 cm. longo lanuginoso squamis sparsis obsito suffultus, cylindricus, 20–45 cm. longus, 6–10 cm. crassus, squamae a dorso visae late obovatae, vertice dilatato rhomboideo 1·5–2 cm. lato, 1·5 cm. alto, lateritio vel virescenti, siccando admodum contractae angulis lateralibus acutis supero inferoque obtusissimis, linea transversa et altera ab angulo supero ad medium ducta elatis notato. *Strobilus* femineus subsessilis, cylindricus, ad 60 cm. longus, ad 18 cm. diametro alutaceo-luteus; squamae a dorso visis ancoriformes, capite 5 cm. lato 2·5 cm. alto, ungue 2·5 cm. longo, vertice rhomboideo ad 5 cm. lato 2·5 cm. alto, more conorum *Pini* specierum quarundam in apophysin elevato apice truncato angulum inferiorem versus sito. *Semina* ellipsoidea vel ovoidea, cinnabarina, ad 3 cm. longa, 2 cm. diametro.—*E. villosus*, forma *Hildebrandtii*, Hennings, l.c. 238.—O. Stapf.

The stately Cycad here described and figured was first discovered by Sir John Kirk near Dar-es-Salam on the East African Coast in 1868. The material originally sent home consisted of some pinnae and a few seeds and proved too incomplete for description. Two years later he made the first attempt to introduce the plant to European cultivation, but the stem which he sent home

in 1870 unfortunately did not survive the journey. Later in the same year Kew received from Sir John a supply of seeds and some of these germinated, one of the plants of this introduction being in the Kew collection in 1881, growing alongside a fine male stem which was successfully transported to this country in 1878. In 1884 Sir John Kirk was again able to transmit a male and also a female stem, both of which have thriven well under the conditions suitable for other tropical Cycads in the Palm House at Kew, where they are still in vigorous health and growth. From these have been obtained the material from which the two plates here given have been prepared.

In the meantime, however, the distinguished traveller Mr. J. M. Hildebrandt had also met with the species on the East African Coast over against the island of Zanzibar, and at other points on the same coast as far north as Mombasa. From the material obtained by him it was described, as *Encephalartos Hildebrandtii*, by Professor Braun and Mr. Bouché in 1874, and between 1874 and 1876 Hildebrandt secured and transmitted to various European gardens a large number of stems. Relying on the appearance of some of these, the late Professor Regel in 1876 suggested that the East African plant might prove to be no more than a local form of the Natal species, *E. villosus*, Lem., of which an account has been given at t. 6654 of this work. The controversy thus raised was taken up by Braun who pointed out the differences between the two species, and in 1880 Professor Eichler confirmed Braun's observations and even suggested that the difference in the shape of the female cone-scales justified the location of the two in distinct sections. In 1890 Professor Hennings, however, on the strength of a female specimen grown in a nursery at Schomberg, near Berlin, which showed characters that led him to consider it a connecting link between the Natal and the East African plant, reverted to the view expressed by Regel. The matter has again been very fully discussed by Dr. Stapf in the Kew Bulletin for 1914, and the conclusion to which he has come, that the view of Braun and Eichler is sound, while that of Regel and Hennings cannot be sustained, seems incontrovertible.

The pinnae figured on t. 8592 are rather wider than is usual in this species.

Description.—*Tree* with a cylindric stem, sometimes very short or at times up to 20 ft. in height, 1 ft. in diameter, closely beset with persistent imbricating leaf-bases. *Leaves* suberect or—at least in cultivated specimens—with the outer spreading, rigid, slightly recurved, up to 9 ft. in length, 1 ft. wide, petiole and rachis at first woolly but soon becoming glabrous and ultimately quite smooth, terete; pinnae 50–70 along each side increasing in size from the base to the middle, the central ones obliquely linear-lanceolate, with acute spinescent tips, up to 9 in. long, $\frac{2}{3}$–1 in. wide, with from 4–1 (usually 2–3) spines on each side, the uppermost spine generally some distance below the tip, rigidly leathery, quite glabrous, indistinctly parallel-nerved, the lowermost pinnae very short and coarsely spinous-toothed. *Male cone* pedunculate, cylindric, 8–18 in. long, $2\frac{1}{4}$–4 in. thick; scales as seen from behind wide-obovate, with dilated rhomboid tip, $\frac{2}{3}$–$\frac{3}{4}$ in. wide, $\frac{2}{3}$ in. long, contracting somewhat in drying, brick-red or greenish-red, their lateral angles acute, above and below blunt, marked by a transverse raised line and by a second ridge extending from the upper angle to the middle; peduncle up to $3\frac{1}{2}$ in. long, woolly, sparingly scaly. *Female cone* subsessile, cylindric, up to 2 ft. long and 7 in. thick, leather-yellow; scales as seen from behind anchor-shaped, the head up to 2 in. wide and 1 in. long, claw 1 in. long, tip rhomboid up to 2 in. wide and 1 in. long with a raised process, as in the scales of cones of various species of *Pinus*, close to the lower angle and truncate at its tip. *Seeds* ellipsoid or ovoid, vermilion, $1\frac{1}{4}$ in. long, $\frac{3}{4}$ in. across.

Tab. 8592. Fig. 1, a male scale; 2 and 3, anthers before and after the discharge of their pollen respectively; 4, sketch of the entire male plant:—1 *of natural size*, 2 *and* 3 *enlarged*, 4 *much reduced.*

Tab. 8593. Fig. 1, scale and seeds; 2, sketch of the entire female plant:—1 *of natural size*, 2 *much reduced.*

Tab. 8594.

COTONEASTER pannosa.

Western China.

Rosaceae. Tribe Pomaceae.

Cotoneaster, *Medik.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 627.

Cotoneaster pannosa, *Franch. in Plant. Delavay.* p. 223; *Bois in Rev. Hort.* 1907, p. 256; species *C. Franchetii*, Bois, quacum nonnunquam in fruticetis confusa, quam maxime affinis, apte tamen foliis minoribus longius petiolatis petalis magis patentibus fructu minore saturatius rubrescente distinguenda.

Frutex deciduus, 2·25–2·5-metralis, laxe graciliterque ramosa; ramuli juniores graciles, primum pallide fusco-tomentosi, demum glabri latereque subdiali atro-purpurascentes. *Folia* ovata vel elliptica, apice acuta obtusa vel rotundata, basi cuneata, margine integra, 0·8–3 cm. longa, 0·4–1·5 cm. lata, supra sordide viridia primum parce pilosa, subtus dense cano-tomentosa; nervi laterales utrinsecus 4–6, obliqui; petiolus 0·6 cm. longus, tomentosus. *Inflorescentia* corymbosa; corymbi 2·5–3 cm. lati, ramulos foliigeros abbreviatos terminantes, 15–25-flori, anthesi aestivales. *Flores* albi, 0·6–0·9 cm. lati; calycis lobi 5, triangulari-ovati, dense lanosi; petala 5, patentia, orbicularia; stamina circiter 20, antheris puniceis; styli 2–3. *Fructus* globosus vel ovatus, 0·6 cm. longus, saturate ruber, tomento laxo plus minusve obtectus; pyrenae saepissime 2, compresso-ovoideae, apice floccosae.—W. J. Bean.

The Cotoneaster which forms the subject of our figure was discovered in 1886 on limestone mountains in South-western Yunnan at altitudes of about 8,000 feet above sea-level by the late Abbé Delavay. Young plants were raised in 1888 from seeds sent by him to the Jardin des Plantes, Paris, whence, six years later, the plant from which material for our illustration has been prepared was sent to Kew. In collections *C. pannosa* is sometimes confused with *C. Franchetii*, Bois, to which it is closely allied. Both have the same marked elegance in growth and both are characterised by a thick tomentum on the young shoots, lower surface of the leaves, pedicels and calyx. But *C. pannosa* is readily distinguished from *C. Franchetii* by its smaller leaves with longer petioles, purer white and more spreading petals, and smaller fruits of a duller deeper red. In the fruiting spray depicted on our plate it will be observed that the majority of the fruits

are oval, only those towards the ends of the branches being globose or nearly so. Sometimes, however, the proportion of globose to oval fruits is reversed, and taken generally, globose fruits outnumber those that are oval. Few shrubs are better adapted for a poor natural soil, such as that of Kew, than the Cotoneasters, and *C. pannosa* is no exception to this rule. It is perfectly hardy and thrives admirably in loam of good or even moderate quality. Propagation is easily effected by means of late summer cuttings in gentle heat or, more slowly, by the seed of which it produces such plentiful crops. This and other species of the genus are to be recommended for gardens situated on calcareous formations.

Description.—*Shrub* with deciduous foliage, about 8 ft. high, of lax graceful habit; young branches slender, clothed at first with a pale brown tomentum, ultimately glabrous and dark purple on the side exposed to the sun. *Leaves* ovate to elliptical, cuneate at the base, acute to bluntish or rounded at the apex, entire, ½–1¼ ins. long, ⅛–⅝ in. wide, dull green and at first sparingly pilose above, clothed beneath with a whitish felt; lateral nerves oblique, four to six; petiole up to ¼ in. long, tomentose. *Corymbs* 1–1¼ ins. wide, terminal on short leafy twigs, 15–25-flowered, opening in late June or early July. *Flowers* ½ to ⅝ in. wide; calyx-lobes 5, triangular-ovate, densely woolly; petals 5, spreading, orbicular; stamens about 20, with pink anthers; styles 2 or 3. *Fruit* roundish to oval, ¼ in. long, deep red, covered more or less with a loose tomentum. *Pyrenes* usually 2, compressed-ovoid, floccose at the broad end.

Fig. 1, bud; 2, a flower in vertical section; 3 and 4, stamens; 5, a pyrene—*all enlarged.*

Tab. 8595 A.

MESEMBRYANTHEMUM thecatum.

South Africa.

Ficoideae. Tribe Mesembryeae.

Mesembryanthemum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 853.

Mesembryanthemum thecatum, *N. E. Br.*; species nova *M. fraterno*, N. E. Br., affinis, sed plantulis coeruleo-viridibus punctis minoribus et minus conspicuis floribus roseo-purpureis et staminibus paucioribus differt.

Herba parva, acaulis, succulenta, caespitosa, glabra. *Folia* in corpuscula obconica, apice leviter convexo-truncata, 7–10 mm. diametro fusa, coeruleo-viridia, punctis sordide viridibus conspersa, fissura centrali 3 mm. longa, pedunculos et ovaria includentia. *Calyx* tubulosus, apice 4-lobus, membranaceus, albidus; lobi ovati vel obovati, obtusi. *Corolla* gamopetala, 1·2–1·5 cm. diametiens, roseo-purpurea, luteo-oculata; petala difformia, exteriora 12–16, 2-seriata, 6–8 mm. longa, 1·5–2 mm. lata, cuneato-linearia, apice obtusa vel denticulata, roseo-purpurea; interiora 12–16, brevissima, linearia, acuminata, lutea, interdum apice roseo-purpurea. *Stamina* 8, 2-seriata, medium tubum corollae attingentia, lutea. *Stylus* 1·5–2 mm. longus, staminibus brevior, apice 4-lobus, viridis.—N. E. Brown.

The pleasing little *Mesembryanthemum* here for the first time described belongs to a group of species in that large genus characterised by each branch or division of the plant bearing at any one time but one pair of leaves which are united for the whole or for part of their extent into one mass, technically termed a "corpusculum." When a fresh pair of leaves, united in a new corpusculum, is being formed, the pair of the previous growth gradually shrivel to a papery consistence through which the new growth bursts. In the case of *M. thecatum*, depicted in the upper half of our plate, the two leaves of each succeeding growth are united throughout and completely envelop the peduncle and ovary, leaving at their apex a mere fissure from which the actual flower protrudes. The species is one of the novelties discovered by Professor Pearson, Director of the National Botanic Garden of South Africa at Kirstenbosch near Cape Town, in the course of his very fruitful journey to the Orange River undertaken in 1910–11 under the auspices and with the

assistance of the Percy Sladen Trust. It was met with growing on dry ridges south of Bakhuis in the Van Rhynsdorp Division of Cape Colony, and the plant from which our figure has been prepared formed part of a very valuable collection of succulents collected by Professor Pearson and his fellow-traveller on the expedition, Mr. N. S. Pillans, which was presented to Kew in 1911. It has thriven well and flowered freely under the conditions suitable for Mesembryanthemums generally. Its flowers open in the morning and close at night, and are devoid of scent; each flower lasts from four to six days.

Description.—*Herb*, small, stemless, succulent, tufted, glabrous. *Leaves* consolidated in obconic bodies, somewhat convex-truncate at the tip, about $\frac{1}{3}$ in. thick, bluish-green with dull green markings, central chink $\frac{1}{8}$ in. long, concealing the peduncle and the ovary. *Calyx* tubular, 4-lobed at the tip, membranous, whitish; lobes ovate or obovate, obtuse. *Corolla* gamopetalous, $\frac{1}{2}$–$\frac{2}{3}$ in. across, rose-purple with a yellow eye; petals of two types, the outer 12–16 are 2-seriate, $\frac{1}{4}$–$\frac{1}{3}$ in. long, $\frac{1}{12}$ in. or less in width, linear-cuneate with blunt or denticulate tips, rose-purple throughout, the inner 12–16 are very short, linear, acuminate, yellow, sometimes rose-purple at the tips. *Stamens* 8, 2-seriate, reaching the middle of the corolla-tube, yellow. *Style* $\frac{1}{2}$ in. long or less, shorter than the stamens, 4-lobed at the tip, green.

Fig. 1, vertical section through a flower and the upper part of a plant; 2, outer and inner petals; 3, style and stigmas:—*all enlarged.*

Tab. 8595 B.

MESEMBRYANTHEMUM stylosum.

South Africa.

Ficoideae. Tribe Mesembryeae.

Mesembryanthemum, *Linn.*, *Benth. et Hook. f. Gen. Plant.* vol. i. p. 853.

Mesembryanthemum stylosum, *N. E. Br.*; species nova *M. bilobo*, Marl., affinis sed major, lobis quam corpuscula longioribus et stylo staminibus longiori differt.

Herba parva, acaulis, succulenta, laxe caespitosa, glabra. *Folia* in corpuscula oblonga, apice 2-loba connata, 2·5–5 cm. alta, 1·2–1·5 cm. lata, 0·8–2 cm. crassa, glauco-viridia, epunctata, lobi ad 2 cm. longi, obtusi, facie interiore plani, dorso rotundati vel obscure carinati, compressi, saepe obliqui; ovarium inclusum. *Calyx* tubulosus, apice 4–6-lobus, inclusus vel ex parte exsertus; lobi 3–6 mm. longi, 1·5–2·5 mm. lati, oblongi, obtusi vel subacuti, submembranacei vel virides. *Corolla* gamopetala, 2–3·5 cm. diametiens, lutea; petala 45–56, 3–4-seriata, 1–1·8 cm. longa, 1–1·5 mm. lata, linearia, obtusa. *Stamina* numerosa, breviter exserta, pallide lutea. *Stylus* apice 5–6-lobus; lobi subulati, rubro-aurantiaci, ultra stamina longe exserti.—N. E. Brown.

The interesting *Mesembryanthemum* which occupies the lower half of our plate is another of the fruits of the Percy Sladen Memorial Expedition to the Orange River, led in 1910–11 by Professor Pearson of Cape Town. Like its companion this species, *M. stylosum*, is a hitherto uncharacterised one, belonging to the same natural group, though in this instance the welding of the two leaves forming each corpusculum is much less complete and the resultant bodies are deeply 2-lobed at the apex. *M. stylosum* was collected on the plains between Chubiessis and Stinkfontein in Little Namaqualand, and the plant from which our illustration has been prepared formed part of the same munificent accession to the succulent collection at Kew for which the institution is indebted to the Percy Sladen Trust and to the travellers who, thanks to their assistance, were enabled to investigate so thoroughly the vegetation of a considerable portion of western Cape Colony. The flowers in *M. stylosum* are bright yellow; they open in the day time and only in bright sunshine. They last for five to six days and are

without odour. The species thrives well under the conditions suitable for fleshy-leaved Mesembryanthemums, of which there is at Kew a large collection. They are most successfully cultivated in a sunny greenhouse or frame, except during summer, when they are placed in the open air. They enjoy a fair allowance of water at the root whilst in growth, but require little or none during winter when they are at rest.

DESCRIPTION.—*Herb*, small, stemless, succulent, loosely tufted, glabrous. *Leaves* fused below in oblong bodies with 2-lobed apices, 1–2 in. long, $\frac{1}{2}$–$\frac{2}{3}$ in. wide, $\frac{1}{3}$–$\frac{3}{4}$ in. thick, glaucous-green, unblotched; lobes up to $\frac{3}{4}$ in. long, obtuse, flat on the ventral, rounded or indistinctly keeled on the dorsal face, compressed, often oblique; ovary enveloped by the base of the mass. *Calyx* tubular, 4–6-lobed at the tip, included or partly exserted; lobes $\frac{1}{8}$–$\frac{1}{4}$ in. long up to $\frac{1}{10}$ in. wide, oblong, obtuse or subacute, somewhat membranous or green. *Corolla* gamopetalous, $\frac{3}{4}$–$1\frac{1}{3}$ in. across, yellow; petals 45–56, 3–4-seriate, $\frac{1}{3}$–$\frac{3}{4}$ in. long, $\frac{1}{16}$ in. wide, linear, obtuse. *Stamens* many, shortly exserted, pale yellow. *Style* 5–6-lobed at the tip; lobes subulate, reddish-orange, exserted far beyond the stamens.

Fig. 1, a stamen; 2, style and stigmas:—*all enlarged.*

4

3

1

2

Vincent Brooks, Day &

Tab. 8596.

TILLANDSIA Regina.

Brazil.

Bromeliaceae. Tribe Tillandsieae.

Tillandsia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 669.

Tillandsia Regina, *Vell. Fl. Flum.* vol. iii. t. 142, et *in Arch. Mus. Nac. Rio*, vol. v. p. 29; *Baker, Handb. Bromel.* p. 227, pro parte; species *I. imperiali*, C. H. Wright (Vriesiae imperiali, *Mez*) affinis, floribus distichis nec secundis differt.

Herba majuscula, acaulis. *Folia* circiter 30 rosulatim disposita, e basi ovata lorata, acuminata, recurva, glauca, subtus dense minuteque lepidota, 1–1·3 m. longa, 7–10 cm. lata. *Pedunculus* 1 m. altus, bracteis apice recurvatis supra gradatim minoribus dense vestitus; panicula 1 m. alta; bracteae ad basin ramorum elliptico-ovatae, acuminatae, 9 cm. longae, 3·5 cm. latae, marginibus roseo-tinctis; bracteolae ovato-deltoideae, concavae, acutae, 4 cm. longae, 1·2 cm. latae. *Sepala* oblonga, obtusa, 4 cm. longa, 5 mm. lata. *Petala* oblonga, obtusa, alba vel lutea, 8 cm. longa, 1 cm. lata; squamae basales 2 cm. longae, 5 mm. latae. *Filamenta* 9 cm. longa; antherae lineares. *Ovarium* conicum.—*Vriesia Regina*, Antoine, Bromel. p. 12, tt. 9–10; Morren in Belg. Hort. 1874, p. 325; André in Ill. Hort. vol. xxii. 1875, p. 54; Gard. Chron. 1875, vol iii. p. 235, fig. 41; Wittm. in Gartenfl. 1891, p. 160, fig. 46–47; Mez in Mart. Flor. Bras. vol. iii. pars 3, p. 569, *et* in DC. Monogr. vol. ix. p. 615. *V. Regina*, var. *Glazioviana*, Wawra in Oesterr. Bot. Zeitschr. vol. xxx. p. 218, *et* in Itin. Princip. Coburg. p. 164. *V. Glazioviana*, Lem. in Ill. Hort. vol. xiv. 1867, t. 516, *et* Misc. p. 43, fig. 2; Morren in Belg. Hort. 1882, p. 335; Regel, Gartenfl. 1868, p. 168; Rev. Hort. Belg. 1903, p. 32. *V. gigantea*, Regel, Gartenfl. 1867, p. 385.—C. H. Wright.

The large Bromeliad here figured is a native of the forests in the provinces of Rio Janeiro and San Paulo in Southern Brazil and has been in cultivation in Europe for upwards of half a century. There are excellent figures of the plant published by Antoine from an example which flowered in the Hofburg Gardens at Vienna in 1874, while it has since then been figured several times, occasionally under synonyms other than the accepted name *Tillandsia Regina*, Vell. This variety of names has been due to the circumstance that the plant itself exhibits some degree of variation; its flowers may be white or yellow and sometimes change from the former to the latter colour during the flowering period. *T. Regina* has been in cultivation at Kew for many

years. Thirty years ago there was a large plant in the *Victoria regia* House, where it was grown in a pot over the lily tank. The plant from which the material for our figure has been derived was raised as an offset from the original plant and was about thirty years old when it flowered in the Mexican Section of the Temperate House, Kew, in May, 1912, dying down soon afterwards. It is of interest to note that in July, 1912, another plant of the same species flowered in the Royal Botanic Garden, Glasnevin. A sufficient supply of seeds has been matured so that it has been possible to raise a stock of young plants. *T. Regina* belongs to the section *Vriesia*, which differs from *Tillandsia* proper in having scales at the base of the petals within. The only species with which it has been confused is *T. imperialis*, C. H. Wright, which is readily distinguished by the flowers being secundly disposed on the branches. There is another species of the same section, even more closely allied to *T. Regina*, which has been figured at t. 8192 of this work. The species in question, *T. Blokii*, Hort., is however, easily recognised by its leaves with red blotches and its blood-red bracts.

Description.—*Herb* of large size, stemless. *Leaves* about 30, rosulate, lorate from an ovate base, acuminate, recurved, glaucous, densely finely lepidote beneath, $3\frac{1}{2}$–$4\frac{1}{2}$ ft. long, 3–4 in. wide. *Peduncle* $3\frac{1}{2}$ ft. high, densely clothed with bracts recurved at the tips, gradually diminishing upwards; panicle $3\frac{1}{2}$ ft. long; bracts at the base of the panicle-branches elliptic-ovate, acuminate, $3\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. wide, with rose-coloured margins; bracteoles ovate-deltoid, concave, acute, $1\frac{1}{2}$ in. long, $\frac{1}{2}$ in. wide. *Sepals* oblong, obtuse, $1\frac{1}{2}$ in. long, $\frac{1}{5}$ in. wide. *Petals* oblong, obtuse, white or yellow, $3\frac{1}{4}$ in. long, over $\frac{1}{3}$ in. wide; basal scales $\frac{3}{4}$ in. long, $\frac{1}{5}$ in. wide. *Filaments* $3\frac{1}{2}$ in. long; anthers linear. *Ovary* conical.

Fig. 1, a petal, showing the basal scales; 2, an anther; 3, ovary; 4, stigma; 5, sketch of the entire plant:—*all enlarged except 5, which is much reduced.*

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Tab. 8597.

MORMODES tigrinum.

Upper Amazon.

Orchidaceae. Tribe Vandeae.

Mormodes, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 552.

Mormodes tigrinum, *Rodr. Gen. et Sp. Orch. Nov.* vol. i. p. 131; *Cogn. in Mart. Flor. Bras.* vol. iii. pars 5, p. 385, t. 82; a *M. igneo*, Lindl., scapis brevioribus, floribus copiose brunneo-maculatis et labello breviore differt.

Herba epiphytica; pseudobulbi erecti, fusiformi-oblongi, multi-articulati, recti vel vix arcuati, 10–17 cm. longi, 2·5–4 cm. lati, apice subattenuati, paucifolii, vaginis membranaceis arcte adpressis vestitis. *Folia* elongato-lanceolata, acuta, subundulata, plicata, arcuata, 30–50 cm. longa, 4–6 cm. lata. *Scapi* axillares, erecti, crassiusculi, 10–15 cm. longi, basi vaginis paucis tubulosis vestiti, multiflori; bracteae ovato-oblongae, subacutae vel obtusae, concavae, 5–8 mm. longae; pedicelli 2·5–3 cm. longi. *Flores* mediocres, speciosi. *Sepala* patentia vel reflexa, oblongo-lanceolata, subacuta, 2·5–3 cm. longa, ochroleuca, copiose purpureo-maculata. *Petala* elliptico-oblonga, subacuta, 2·5–3 cm. longa, ochroleuca, copiose purpureo-maculata. *Labellum* carnosum, basi angustum, erectum, dein oblique incurvo-ascendens, indivisum, late subdeltoideo-reniforme, 2·5–3 cm. longum, apice acutiusculum, marginibus valde revolutis expansis 2–2·5 cm. longis, luteum, copiose brunneo-maculatum. *Columna* oblique incurva, clavata, apiculata, 1·5 cm. longa; anthera apiculata; pollinia 2, cerea, oblonga, stipiti loriformi affixa; glandula squamiformis. —R. A. Rolfe.

The striking Orchid which forms the subject of our illustration belongs to the genus *Mormodes*, which is most nearly allied to *Catasetum*, Rich., but differs therefrom in its hermaphrodite flowers, and in the oblique twisting to one side of the lip, the margins of which are also sharply recurved so as to form a tube which rests upon the equally oblique apex of the column. The method of fertilisation was discussed by the late Mr. Darwin. The species was originally discovered in the forests of the Rio Negro and was described in 1877, from specimens collected there, by the late Mr. Barbosa Rodrigues. Some twelve years afterwards it was again met with in the Rio Negro district and was then introduced to cultivation by Messrs. Sander and Sons, St. Albans, in whose establishment a plant flowered in 1890. At a later date it was introduced afresh, this time from the

Amazon district, by Messrs. Hugh Low and Company. The plant from which our plate has been prepared is one which was purchased, when in flower, in February, 1914, for the Kew collection from Messrs. Sander. It formed part of a recent importation, once more from the Upper Amazon district, though the precise locality is not indicated, sent to St. Albans by Mr. Forget. The nearest ally of *M. tigrinum* is *M. igneum*, Lindl., a Peruvian species from which it is distinguished by its differently coloured flowers with a shorter lip. Both species thrive well in a tropical house under the conditions suitable for species of *Catasetum*.

Description.—*Herb*, epiphytic; pseudobulbs erect, fusiform-oblong, many-jointed, straight or very slightly curved, 4–7 in. long, 1–1½ in. wide, rather narrowed upwards, few-leaved, clothed with closely adpressed membranous sheaths. *Leaves* elongate-lanceolate, acute slightly undulate, plicate, curved, 1–1½ ft. long, 1½–2¼ in. wide. *Scapes* axillary, erect, rather stout, 4–6 in. long, clothed at the base with a few tubular sheaths, many-flowered; bracts ovate-oblong, subacute or obtuse, concave, ⅕–⅓ in. long; pedicels 1–1¼ in. long. *Flowers* medium-sized, showy. *Sepals* spreading or reflexed, oblong-lanceolate, subacute, 1–1¼ in. long, yellow with numerous purple blotches. *Petals* elliptic-oblong, subacute, 1–1¼ in. long, yellow with numerous purple blotches. *Lip* fleshy, narrowed at the base, at first erect then obliquely ascending and incurved, entire, widely and somewhat deltoidly reniform, 1–1¼ in. long, rather acute at the tip, the margins strongly revolute, when flattened out ¾–1 in. long, yellow with numerous brown markings. *Column* obliquely incurved, clavate, apiculate, ⅔ in. long; anther apiculate; pollinia 2, waxy, oblong, supported by a thong-like stipe, with a scale-like gland.

Fig. 1, column with lower part of lip; 2, anther-cap; 3, pollinarium:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Tab. 8598.

RHODODENDRON MOUPINENSE.

Western China.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (§ Lepidorhodium) **moupinense**, *Franch. in Bull. Soc. Bot. Fr.* vol. xxxiii. p. 233 (1886); et *in Nouv. Arch. Mus. Paris*, sér. II. vol. x. p. 52, t. 12 (1887–88); *Rehder et Wilson in Sargent Pl. Wilsonianae*, pars 3, p. 525 (1913); *Bean in Kew Bull.* 1914, p. 203, cum icon.; species ramulis nigro-pilosis, foliis subverticillatis basi subcordatis, petiolis nigro-pilosis, floribus magnis 1–3-natis corollae lobis profunde emarginatis valde distincta.

Frutex circiter 0·7 m. altus, silvestris saepe epiphyticus; rami superne foliati, subteretes, circiter 2·5 mm. crassi, nigro-pilosi, demum glabri. *Folia* subverticillata, oblongo-elliptica vel ovato-elliptica, apice abrupte et obtuse mucronata, basi rotundata vel subcordata, 2–4·5 cm. longa, 1–2·5 cm. lata, rigide coriacea, margine valde recurvata, saepius ciliata, demum glabra, supra glabra costa parce puberula excepta, leviter verrucosa, infra glandulis flavis dense lepidota; costa basi 1·25 mm. lata, ad apicem leviter sensim angustata; nervi laterales plerumque 8, alterni, e costa sub angulo 45° abeuntes, supra paullo immersi, minute flexuosi, infra vix conspicui; petioli crassi, 3–5 mm. longi, plerumque dense nigro-pilosi. *Flores* terminales, 1–3-nati, breviter pedicellati; pedicelli ad 7 mm. longi, minute puberuli, 1·25 mm. crassi. *Perulae* late ovato-orbiculares, mucronulatae, usque ad 1·5 cm. longae, extra parce glandulosae, ciliolatae, superne carmineae. *Calyx* bene evolutus, foliaceus, 5-lobus, lobis suborbicularibus 3 mm. latis parce ciliolatis extra albido-glandulosis. *Corolla* alba, 6 cm. expansa, in tubi parte posteriore rubro-maculata; tubus late infundibuliformis, 2·5–3·5 cm. longus, extra glaber, intus inferne molliter pubescens; lobi 5, patentes, profunde emarginati, 2 cm. longi, 2–2·5 cm. lati. *Stamina* 10, breviter exserta; filamenta 2·3–2·5 cm. longa, inferne pilis albis patulis pilosa; antherae conspicuae, 5–6 mm. longae, carmineae. *Ovarium* basi disco carnoso 1 mm. alto glabro circumdatum, 5-loculare, ovoideum, circiter 4 mm. altum, viride, dense lepidotum; stylus exsertus, 2·5–3 cm. longus, glaber, stigmate capitato 2 mm. diametro coronatus. *Fructus* pedicello 1–1·3 cm. longo, 1·25 mm. crasso suffultus, anguste ellipsoideus, 2 cm. longus, 1 cm. diametro, lepidotus, primum stylo indurato rostratus, demum erostratus, endocarpio crustaceo.—J. HUTCHINSON.

The pleasing *Rhododendron* here figured is a native of the mountains of Szechuan in Western China, where it occurs at altitudes of 6,000–10,000 feet above sea-level. It was first found in 1870, in the neighbourhood of Moupine, by the late Abbé David. It was again met with on Mount Omi and on neighbouring mountains by Mr. E. H. Wilson in 1908, and our figure has been prepared

from a plant raised from Wilson's seed of this last gathering, received at Kew from the Arnold Arboretum in the spring of 1909. The species was described from the Abbé David's specimens by the late Mr. Franchet as *R. moupinense*. It is a very distinct plant readily recognised in the section with glandular leaves by the subverticelled somewhat cordate leaves, the large leafy calyx, the black-pilose twigs and petioles, the large white corollas spotted with red within the posterior side of the tube, and by the large conspicuous carmine anthers. The species is of sturdy dense habit, and as young plants speedily reach the flowering stage, blossoming for the first time when three or four years old and only a few inches in height, it is admirably adapted for the Rock Garden. According to Wilson it reaches a height of two to four feet and is usually found growing upon evergreen oaks and other broad-leaved trees. But in spite of its epiphytic character it appears to thrive very well in the sandy peat in which rhododendrons as a whole do so well. It has hitherto flowered in February and March, a date so early as to render the blossoms liable to injury by frost.

Description.—*Shrub*, usually about $2\frac{1}{2}$ ft. high, in the wild state often epiphytic; branches leafy upwards, subterete, $\frac{1}{10}$–$\frac{1}{5}$ in. thick, black-pilose, at length glabrous. *Leaves* somewhat verticillate, oblong-elliptic or ovate-elliptic, apex abruptly and bluntly mucronate, base rounded or subcordate, $\frac{3}{4}$–$1\frac{3}{4}$ in. long, $\frac{1}{3}$–1 in. wide, firmly coriaceous, margin strongly recurved, usually ciliate, at length glabrous, above glabrous save for the sparingly puberulous midrib, slightly verrucose, beneath densely lepidote with yellow glands; midrib slightly narrowed from base to apex; lateral nerves usually 8, alternate, leaving the midrib at an angle of 45 degrees, slightly sunk above and faintly flexuous, beneath inconspicuous; petioles stout, $\frac{1}{8}$–$\frac{1}{5}$ in. long, usually densely black-pilose. *Flowers* terminal, 1–3-nate, shortly pedicelled, pedicels about $\frac{1}{4}$ in. long, finely puberulous, slender. *Perulae* widely ovate-orbicular, mucronulate, over $\frac{1}{2}$ in. long, sparingly glandular outside, ciliolate, scarlet towards the tip. *Calyx* well-developed, foliaceous,

5-lobed, the lobes suborbicular, $\frac{1}{8}$ in. wide, sparingly ciliolate, outside white-glandular. *Corolla* white, $2\frac{1}{4}$ in. across, red-dotted within the tube behind; tube wide funnel-shaped, 1–$1\frac{1}{2}$ in. long, glabrous outside, softly pubescent in the lower portion within; lobes 5, spreading, deeply emarginate, $\frac{3}{4}$ in. long, $\frac{3}{4}$–1 in. wide. *Stamens* 10, shortly exserted; filaments about 1 in. long, pilose low down with white spreading hairs; anthers conspicuous, about $\frac{1}{4}$ in. long, carmine. *Ovary* surrounded at the base by a shallow fleshy glabrous disk, 5-locular, ovoid, about $\frac{1}{6}$ in. long, green, densely lepidote; style exserted, 1–$1\frac{1}{4}$ in. long, glabrous; stigma capitate, $\frac{1}{12}$ in. across. *Fruit* supported on a slender pedicel $\frac{1}{3}$–$\frac{1}{2}$ in. long, narrow-ellipsoid, $\frac{3}{4}$ in. long, $\frac{2}{5}$ in. across, lepidote, tipped at first by the hardened style, but at length beakless; endocarp crustaceous.

Fig. 1, upper half of a leaf showing the mucronate apex and the glandular scales on the lower surface; 2, scales; 3, calyx and pistil; 4, section of calyx and the ovary; 5 and 6, stamens; 7, transverse section of ovary:—*all enlarged.*

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Tab. 8599.

EUGENIA uniflora.

Tropical South America.

Myrtaceae.

Eugenia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 718.

Eugenia uniflora, *Linn., Sp. Pl.* p. 470; *Duthie in Fl. Brit. Ind.* vol. ii. p. 505; species *E. ligustrinae*, Willd., affinis sed foliis latioribus, petiolisque brevioribus facile distinguenda.

Frutex vel *arbor* parva, ramulis teretibus glabris, internodiis foliis subaequilongis. *Folia* opposita, ovato-elliptica, apice obtuse acuminata, basi rotundata, usque ad 6 cm. longa et 3·5 cm. lata, pagina inferiore costa nervis reticulationeque prominentibus, superiore costa leviter impressa, nervis et reticulatione prominulis, nervis lateralibus utrinque numerosis marginem versus anastomosantibus, integra, glabra, punctata, petiolo usque ad 3 mm. longo suffulta. *Flores* solitarii, axillares, saepissime remoti; pedunculus teres, usque ad 3·5 cm. longus, glaber. *Sepala* 4, declinata, persistentia, in fructu maturo erecta vel leviter incurva, oblonga, subobtusa, 5 mm. longa, 2·5 mm. lata, ciliolata. *Petala* 4, alba, declinata, oblongo-obovata, apice rotundata, 7 mm. longa, 4·5 mm. lata, ciliolata. *Stamina* numerosa, 3–4-seriata, filamentis usque ad 6 mm. longis glabris, antheris 0·75 mm. longis. *Receptaculum* late turbinatum, glabrum. *Stylus* simplex, 6 mm. longus, glaber. *Fructus* plus minusve sphaericus, 2·5–3 cm. diametro, profunde sulcatus, ruber, sepalis persistentibus erectis coronatus.—*E. Michelii*, Lamk, Encyc. Meth. vol. iii. p. 203; DC. Prodr. vol. iii. p. 263. *E. Willdenowii*, DC. Prodr. vol. iii. p. 265. *E. Parkeriana*, DC. Prodr. vol. iii. p. 271. *Myrtus brasiliana*, Linn. Sp. Pl. p. 674. *Plinia rubra*, Linn. Mant. pars 2, p. 243. *P. pedunculata*, Linn. f. Suppl. p. 253; Bot. Mag. t. 473. *Stenocalyx Michelii*, Berg in Mart. Flor. Bras. vol. xiv. pars 1, p. 337.—W. B. Turrill.

The member of the Myrtle family which is here depicted is a species which was already figured in this work, at t. 473, more than a century ago. This species, *Eugenia uniflora*, is a native of Brazil and other parts of tropical America, but there are few tropical regions in which it is not cultivated, while in many it has become naturalised and established as a denizen in the vegetation. The specimen on which Linnaeus originally based his diagnosis came as a matter of fact from India. This may help to account for the fact that when he had to deal with a specimen of the same plant from a country of which it is really a native the illustrious Swede renamed it *Plinia pedunculata*, under which synonym it was described in these pages in 1799. We have not,

however, taken the unusual course of supplying a second portrait of the same species owing to the fact that in the previous instance it was alluded to under an unnecessary name, but because in 1799 the fruit, which is not always to be met with in cultivated specimens, could not then be illustrated. The plant from which the material for our plate has been derived is one which was presented to Kew by the Director of the Jardin Colonial, Paris, under the name *E. Michelii*, Lamk. It has been grown in the great Palm House in a pot and has formed a much-branched shrub, some seven feet in height. There it fruited freely in May, 1914, and has enabled us to supplement the original plate. The fruits are edible. The specimen now figured, like that figured in 1799, is typical of the species, which, however, exhibits a certain degree of variation in the disposition of the flowers.

DESCRIPTION.—*Shrub* or small *tree*; twigs terete and glabrous, internodes about as long as the leaves. *Leaves* opposite, ovate-elliptic, with an obtusely acuminate apex and a rounded base, up to $2\frac{1}{2}$ in. long and $1\frac{1}{2}$ in. broad; on the lower surface midrib, nerves, and smaller veins raised, on the upper midrib slightly impressed, but the nerves and smaller veins slightly raised; lateral nerves numerous on each side of the midrib, anastomosing towards the entire margin; lamina glabrous and punctate, supported by a petiole which is up to $\frac{1}{8}$ in. long. *Flowers* solitary, axillary, usually distant; peduncle terete, up to $1\frac{1}{2}$ in. long, glabrous. *Sepals* 4, declinate, persistent, erect or slightly incurved in the mature fruit, oblong, subobtuse, $\frac{1}{5}$ in. long, $\frac{1}{10}$ in. broad, somewhat ciliate. *Petals* 4, white, declinate, oblong-obovate, with a rounded apex, over $\frac{1}{4}$ in. long, $\frac{1}{6}$ in. broad, somewhat ciliate. *Stamens* numerous, 3–4 seriate; filaments glabrous, up to $\frac{1}{4}$ in. long; anthers very short. *Receptacle* glabrous, broadly turbinate. *Style* simple, $\frac{1}{4}$ in. long, glabrous. *Fruit* more or less spherical, $1–1\frac{1}{4}$ in. in diameter, deeply sulcate, red, crowned by the persistent sepals.

Fig. 1, a flower; 2, calyx and pistil; 3, anther; 4, transverse section of ovary near base; 5, the same, near the apex; 6, transverse section of fruit:—*all enlarged except* 6, *which is of natural size.*

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L. Reeve [illegible] London.

Vincent Brooks, Day & Son Lith.

Tab. 8600.

CIRRHOPETALUM Fletcherianum.

New Guinea.

Orchidaceae. Tribe Epidendreae.

Cirrhopetalum, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 504.

Cirrhopetalum Fletcherianum, *Rolfe*; species a *C. robusto*, Rolfe, foliis multo longioribus et glaucis, floribus multo majoribus, purpureo-suffusis et maculatis, sepalis acuminatis valde differt.

Herba magna, epiphytica. *Rhizoma* validum. *Pseudobulbi* approximati, subglobosi vel quadrati, subcompressi, transverse corrugati et purpureo-lineati, 2–6 cm. lati, monophylli. *Folia* sessilia, elliptica vel oblonga, obtusa, coriacea, glauca, purpureo-marginata, 5–35 cm. longa, 3–10 cm. lata. *Scapi* laterales, breves, robusti, umbellati, 5–7-flori. *Bracteae* ignotae. *Pedicelli* 4 cm. longi. *Flores* maximi, purpureo-suffusi et maculati. *Sepalum* posticum incurvum, ovato-oblongum, acuminatum, subconcavum, 6–7 cm. longum; sepala lateralia recurva, medio connata, lanceolato-oblonga, apice valde acuminata et libera, 9–10 cm. longa, marginibus revolutis. *Petala* ovata, apice acuminata, subacuta, circiter 2·3 cm. longa. *Labellum* unguiculatum, subcarnosum, cordato-ovatum, apice recurvum et subobtusum, circiter 1 cm. longum, disco obtuse bicarinato. *Columna* lata, circiter 1 cm. longa; dentes breves, acuti.—*Bulbophyllum Fletcherianum*, Hort.; Gard. Chron. 1914, vol. lv. pp. 320, 321, fig. 142; Orch. Rev. 1914, p. 164.—R. A. Rolfe.

The very striking Orchid of which a figure is here given was first imported to England from New Guinea by Messrs. Hugh Low and Company, Enfield, and at once attracted attention. Its long pendulous leaves with a glaucous upper surface suggested comparison with the genus *Phalaenopsis*, owing to the resemblance they bore to those of *P. Schilleriana*; at the same time the pseudobulbs indicated affinity with the genus *Bulbophyllum*. In May, 1914, a plant in the possession of Mr. E. V. Low, Vale Bridge Nursery, Hayward's Heath, produced an inflorescence. This plant later became the property of the Rev. J. C. B. Fletcher, Mundham Vicarage, Colchester, by whom it was exhibited at a meeting of the Royal Horticultural Society under the name *Bulbophyllum Fletcherianum*. From a water colour sketch of the plant and a single flower presented to Kew

by Mr. Fletcher, supplemented by the use of a living plant kindly lent for the purpose by Messrs. Stuart Low and Company, Jarvisbrook, Sussex, it has been possible to prepare the accompanying plate. The species is not a *Bulbophyllum*, if that name be employed in its proper and more restricted sense, but a *Cirrhopetalum*. Its affinity is not very clear, but it bears a rather remote resemblance to another New Guinea species, which has been figured at t. 7557 of this work as *C. robustum*, Rolfe, which has, however, much smaller green leaves and much smaller flowers. The leaf in the background of our plate is a portrait of one of the leaves on Mr. Fletcher's plant; the largest of the leaves on that plant, it may be added, was fourteen inches long. The smaller plant, shown entire on our plate, is that in the possession of Messrs. Stuart Low and Company. It has been propagated from a small side growth and as yet is far from being fully developed. The cultivation suitable for other species of *Bulbophyllum* and *Cirrhopetalum* has been found appropriate for this species.

Description.—*Herb* of considerable size, epiphytic. *Rootstock* stout; pseudobulbs close-set, subglobose or quadrate, somewhat compressed, transversely wrinkled and streaked with purple lines, $\frac{3}{4}$–$2\frac{1}{4}$ in. across, 1-foliate. *Leaves* sessile, elliptic or oblong, obtuse, coriaceous, glaucous, purple-edged, 2–14 in. long, $1\frac{1}{4}$–4 in. wide. *Scapes* lateral, short, stout, umbellately 5–7-flowered; bracts not seen; pedicels $1\frac{3}{4}$ in. long. *Flowers* very large for the genus, suffused and blotched with purple. *Sepals*: posterior incurved, ovate-oblong, acuminate, somewhat concave, $2\frac{1}{2}$–$2\frac{3}{4}$ in. long; lateral recurved, connate in the middle, lanceolate-oblong, finely acuminate and free towards their tips, $3\frac{3}{4}$–4 in. long, their edges revolute. *Petals* ovate, subacute with an acuminate tip, rather less than 1 in. long. *Lip* clawed, rather fleshy, cordate-ovate, tip recurved and somewhat blunt, about $\frac{1}{3}$ in. long; disk bluntly 2-keeled. *Column* broad, about $\frac{1}{3}$ in. long; teeth short, acute.

Fig. 1, a petal; 2, lip with column, showing the foot of the latter; 3, lip, showing the claw; 4, front view of the column; 5, pollinia:—*all enlarged*.

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Ltd imp

Tab. 8601.

RHODODENDRON STAMINEUM.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (§ Choniastrum) **stamineum**, *Franch. in Bull. Soc. Bot. Fr.* vol. xxxiii. (1886) p. 236; *Hemsl. in Journ. Linn. Soc.* vol. xxvi. p. 30; *Hemsl. et Wilson in Kew Bull.* 1910, p. 116; *Rehder et Wilson in Sargent Pl. Wilsonianae*, p. 546; species in sectione *Choniastro*, Franch., staminibus longe exsertis valde distincta.

Frutex; ramuli subteretes, circiter 3 mm. crassi, cortice glabro pallide brunneo obtecti. *Folia* ovato-lanceolata, basi obtusa, apice sensim subobtuse acuminata, 5–10 cm. longa, 2–3·5 cm. lata, margine cartilaginea, rigide coriacea, supra nitida, intense viridia, infra pallide viridia, utrinque glabra et eglandulosa; costa supra leviter impressa, infra prominens, basi circiter 1·5 mm. lata, apicem versus attenuata; nervi laterales venique utrinque vix-distincti; petioli 0·5–1 cm. longi, 1·75 mm. crassi, supra anguste rimosi, glabri. *Inflorescentia* circiter 10-nata; flores in fasciculos axillares 3–4-floros dispositi; pedicelli 2 cm. longi, 0·5 mm. crassi, glabri. *Calycis* segmenta 5, subaequalia, lineari-lanceolata, obtusa, 1–3 mm. longa, membranacea, glabra. *Corolla* infundibuliformis, alba, labio posteriore inferne flavo; tubus cylindricus, 1·3–1·5 cm. longus, circiter 3 mm. diametro, utrinque glaber; lobi 5, subrecurvati, oblongo-lanceolati, subacuti, 1·5–2·5 cm. longi, glabri. *Stamina* 10, magnopere exserta; filamenta usque ad 4 cm. longa, inferne breviter albo-pilosa; antherae lutescentes, sicco fere albae, ellipsoideae, 2 mm. longae. *Ovarium* 5-loculare, elongatum, 4–5 mm. longum, glabrum vel parce pubescens, eglandulosum; stylus longe exsertus, 5 cm. longus, gracilis, glaber, stigmate subcapitato 2 mm. diametro coronatus.—*R. pittosporaefolium*, Hemsl. in Journ. Linn. Soc. vol. xxvi. (1889), p. 29; Diels in Engl. Bot. Jahrb. vol. xxix. p. 515; Bean in Flora & Sylva, vol. iii. p. 164. *R. aucubaefolium*, Hemsl. in Journ. Linn. Soc. l.c., p. 19, quoad flores; folia ad *Daphniphyllum macropodum* pertinent; Bean in Flora & Sylva l. c. 162.—J. Hutchinson.

The *Choniastrum* section of the genus *Rhododendron* includes a small and fairly compact group of seven species distinguished from their congeners by the position of the flowers, which are produced from axillary buds crowded at the ends of the branches. This character is always associated with eglandular persistent leaves and long tubular funnel-shaped corollas; even the seed-pods in this group have a facies of their own. Within the *Choniastrum* group the subject of our illustration,

R. stamineum, differs from its allies in having strikingly long, far-exserted stamens. A native of Western China, where it was met with by Mr. E. H. Wilson in 1900 when collecting on behalf of Messrs. J. Veitch and Sons, it affects particularly rocky shady ravines; although widely spread in that region, it is, according to Mr. Wilson, nowhere really common. For the material from which the accompanying plate has been prepared we are indebted to Mr. J. C. Williams, Caerhays Castle, Gorran, Cornwall, in whose renowned collection it flowered in April, 1914. The plant by which that material was provided grows, Mr. Williams informs us, on a steep hillside which faces east, but is well sheltered on all sides from the wind, with no shade save what is afforded by the contour of the locality, and fully exposed to whatever of sun its side of the hill receives. This plant, which was obtained by Mr. Williams from Messrs. Veitch in 1903 and is now nearly six feet in height and some five feet through near the ground, has borne stray flowers for three years and is now, in 1915, covered with bud. At Caerhays *R. stamineum* has been tried in other aspects, and the most vigorous individual plant in the collection there is in partial shade on a hillside which faces rather to the north of east. But while this example of *R. stamineum* forms a beautiful evergreen with a fine black-green foliage and young growths of a charming bronze colour, it has not yet, although thirteen years old, produced any flowers. Mr. Williams remarks that in his experience the sun kills more plants at Caerhays than does the frost, though the wind is always the worst enemy, and that if only the wind can be kept out, a hillside which faces east or north-east is preferable for most of the Rhododendrons. From the experience in other collections it would appear that *R. stamineum* is not an easy plant to keep in vigorous health or to flower freely. When success attends the effort, the pains expended are well recompensed whether for the charm of the form or the fragrance of the flowers. At Caerhays it is propagated by means of layering.

DESCRIPTION.—*Shrub*; twigs subterete, about $\frac{1}{8}$ in. thick; bark glabrous, pale brown. *Leaves* ovate-lanceo-

late, gradually bluntly acuminate, base rounded, margin cartilaginous, 2–4 in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. wide, firmly leathery, shining and bright green above, pale green beneath, glabrous on both sides and devoid of glands; midrib slightly sunk above, raised beneath, widened towards the leaf base, narrowed towards the leaf-tip; lateral nerves and veins rather obscure on both surfaces; petiole $\frac{1}{4}$–$\frac{1}{3}$ in. long, slender, narrowly furrowed above, glabrous. *Inflorescence* more or less 10-nate, its flowers fragrant, arranged in 3–4-flowered axillary clusters; pedicels $\frac{3}{4}$ in. long, slender, glabrous. *Calyx* 5-lobed; segments subequal, linear-lanceolate, blunt, $\frac{1}{8}$ in. long or shorter, membranous, glabrous. *Corolla* funnel-shaped, white, upper lip yellow at the base; tube cylindric, $\frac{1}{2}$–$\frac{2}{3}$ in. long, about $\frac{1}{8}$ in. wide, glabrous without and within; lobes 5, somewhat recurved, oblong-lanceolate, subacute, $\frac{2}{3}$–1 in. long, glabrous. *Stamens* 10, far exserted; filaments up to $1\frac{1}{2}$ in. long, sparingly white-pilose in the lower fourth; anthers yellowish, almost white when dry, ellipsoid, $\frac{1}{12}$ in. long. *Ovary* 5-celled, elongate, $\frac{1}{6}$–$\frac{1}{5}$ in. long, glabrous or sparingly pubescent, eglandular; style far exserted, 2 in. long, slender, glabrous; stigma subcapitate, $\frac{1}{12}$ in. across.

Fig. 1, upper portion of leaf; 2, pistil; 3, stamen; 4, anther; 5, transverse section of ovary :—*all enlarged.*

M.S. del. J.N. Fitch lith.

L. Reeve & Co. London.

Tab. 8602.

PINGUICULA gypsicola.

Mexico.

Lentibulariaceae.

Pinguicula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 988.

Pinguicula gypsicola, *T. S. Brandegee in Univ. Calif. Publ.* vol. iv. p. 190 (1911); inter species sectionis *Ochreosanthi* heterophyllia egregia, foliis aestivis e basi lanceolata linearibus longis distincta.

Herba, florens ad 9 cm. alta. *Folia* numerosa, heteromorpha: aestiva sub anthesi exstantia e basi lanceolata linearia, marginibus revolutis, ad 5 vel 6 cm. longa, basi 6–7 mm. lata, pallide viridia, in pagina superiore undique pilis viscoso-glandulosis vestita; hiberna more *Sempervivorum* in rosulam densissimam circiter 2 cm. diametro congesta, spathulato-oblonga, obtusa, ad 8 mm. longa, 3–3·5 mm. lata, facie plana, dorso obtuse carinata, margine eglanduloso-ciliata, caeterum praeter apicem glanduloso-pilosum glabra. *Flores* pedicellis 7–8 cm. longis glanduloso-pilosis insidentes. *Sepala* late oblonga, obtusa, 2·5 mm. longa, inferiora approximata, glanduloso-ciliata. *Corolla* purpurea, tubo perbrevi ore albo; labium superum 2-fidum, segmentis lineari-oblongis superne paululo latioribus fere 12 mm. longis ad 4 mm. latis; labium inferum profunde 3-partitum, segmentis lineari-oblongis superne dilatatis subtruncatis, intermedio 12–13 mm. longo 5–5·5 mm. lato, lateralibus paululo brevioribus vix angustioribus; os dense pilis albis stipatum; calcar gracile, apice 2-dentatum, purpurascens, ad 3 cm. longum, horizontaliter patens vel subdescendens, tenuiter glanduloso-pilosiusculum. *Stigma* labii superioris basi arcte applicatum, lobo superiore minuto apiculiformi, inferiore late suborbiculato.—O. Stapf.

The interesting Butterwort here figured is a native of Mexico, where it was first discovered by Dr. Purpus in 1910 growing on wet gypsum rocks at Minas de San Rafael in the State of San Luis Potosi. The plant from which our plate has been prepared was purchased in 1912 from Mr. R. Graessner of Perleberg. Besides being of pleasing aspect *Pinguicula gypsicola* is remarkable on account of the heteromorphy of its leaves. Those present at the time of flowering are, as depicted in our main-figure, long-linear with widened base and, when young, involute tips, and are two inches or so in length. When flowering is over these long leaves gradually die off centripetally, while in the crown a rosette is formed,

the leaves of which resemble those of some species of *Sempervivum*. When finally the linear leaves have wholly disappeared there is left only a compact rosette, some three-quarters of an inch through, such as is shown in fig. 5 of our plate, composed of winter-leaves one-third of an inch long. After persisting for a time these winter-rosettes behave exactly like the summer ones; their component leaves gradually die off centripetally while a new long-leaved flowering rosette gradually forms. So different in appearance are these rosettes that when seen apart no connection between them is suggested. The hairs of the summer-leaves are all many-celled and gland-tipped; those of the winter-leaves vary, the cilia from the base upwards to near the tip being unicellular and eglandular, while at the tip the indumentum consists of many-celled hairs ending in minute glands. The transition from the summer- to the winter-rosette is fairly abrupt, and is well indicated in fig. 7 of our plate. Still more abrupt, however, is the passage from the winter- to the summer-rosette. Summer-rosettes, before passing into the winter-stage branch, though rather sparingly; these branches develop into daughter-rosettes of the winter-stage which may be detached and thus afford a means of propagation. The plant apparently does not depend entirely upon a gypsum substratum; at Kew it has thriven well and flowered freely in July, when grown in sphagnum moss kept saturated with water. Like many other species of *Pinguicula*, *P. gypsicola* has shown considerable variation in the size of the flower. At Kew the corolla-lobes have been nearly half-an-inch long; in the specimens described by Mr. Brandegee the corolla-lobes were about half that length. At Kew it has been found possible to raise hybrids between *P. gypsicola* and *P. caudata*, Schlecht., another Mexican species.

Description.—*Herb*, when in flower $3\frac{1}{2}$ in. high. *Leaves* many, heteromorphous; summer-leaves, when the plant is in flower, linear from a rather wider lanceolate base, 2–$2\frac{1}{4}$ in. long, and at their origin about $\frac{1}{4}$ in. wide, with revolute margins, pale green, clothed throughout the upper surface with viscid-glandular hairs; winter-leaves clustered in a very dense rosette about $\frac{3}{4}$ in. across,

resembling that of a house-leek, each leaf spathulate-oblong, obtuse, $\frac{1}{3}$ in. long, about $\frac{1}{7}$–$\frac{1}{8}$ in. wide, flat above, bluntly keeled behind, margin ciliate but not glandular, elsewhere glabrous except for the glandular-ciliate tip. *Flowers* rather showy; pedicels glandular-pilose, about 3 in. long. *Sepals* wide-oblong, obtuse, $\frac{1}{10}$ in. long, the lower close together, glandular-ciliate. *Corolla* purple, tube very short, white; upper lip 2-fid, lobes linear-oblong, slightly widened upwards, nearly $\frac{1}{2}$ in. long, $\frac{1}{6}$ in. wide; lower lip deeply 3-partite, lobes linear-oblong, widened upwards, somewhat truncate, the central lobe quite $\frac{1}{2}$ in. long, $\frac{1}{5}$ in. wide, rather shorter but hardly narrower than the lateral lobes; mouth densely beset with white hairs; spur slender, 2-toothed at the tip, purplish, over 1 in. long, horizontally spreading or somewhat descending, sparsely glandular-puberulous. *Stigma* closely applied to the base of the upper lip of the corolla; upper stigmatic lobe minute, pointed, lower broadly suborbicular.

Fig. 1, portion of a summer-leaf; 2, base of a flower, laid open; 3 and 4, pistil; 5, a winter-rosette; 6, a winter-leaf; 7, latest phase of stage of transition from a summer- to a winter-rosette:—*all enlarged except* 5 *and* 7, *which are of natural size.*

M.S del J.N Fitch lith.

Vincent Brooks Day & Son Lith.

L. Reeve & Co London.

Tab. 8603.

LOTUS CAMPYLOCLADUS, forma VILLOSIOR.

Canary Islands.

Leguminosae. Tribe Loteae.

Lotus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 490; *Brand in Engl. Jahrb.* vol. xxv. p. 166.

Lotus (§ Pedrosia) campylocladus, *Webb et Berth. Phyt. Canar.* vol. ii. p. 83, forma villosior, *Sprague*; caulibus, foliis, calycibus patule villosis, foliolis longioribus agnoscendus.

Herba radice lignoso, a basi ramosa, caulibus ascendentibus basi lignescentibus ramosis superne ut folia calycesque breviter denseiuscule patule villosis; internodia in planta culta 1–2·5 cm. longa, in silvestribus ad 5 cm. longa. *Folia* petiolata, trifoliolata; foliola subsessilia, cuneata, apice retusa vel subtruncata, rarius rotundata, in planta culta 3–6 mm. longa, 1–2 mm. lata, in sylvestribus ad 11 mm. longa, 3 mm. lata; petiolus foliolis brevior; stipulae foliaceae, petiolum aequantes vel superantes, elliptico-oblongae. *Umbellae* longiuscule pedunculatae, bractea singula suffultae, capitelliformes, 3–5-florae; pedunculus 3–5 cm. longus; pedicelli vix 1 mm. longi; bractea sessilis, plerumque unifoliolata, rarius trifoliolata. *Calyx* infundibulari-campanulatus, bilabiatus; lobi ascendentes, subulato-lanceolati, tubum aequantes vel superantes, duo postici 4 mm. longi, tres antici 2·5–3 mm. longi. *Corollae* vexilli limbus ovatus, 1 cm. longus, luteus, rubro striatus; unguis circiter 3 mm. longus marginibus sub angulo recto inflexis inferne per 0·5 mm. connatis; alae cymbiformes, auriculatae, circiter 1 cm. longae unguе 2·5 mm. longo excluso, auriculis et marginibus anticis infra apicem leviter cohaerentes, auriculo vix 1 mm. longo valde concavo; carinae petala antici connata, postice leviter cohaerentia, rostrato-cymbiformia, 8·5 mm. longa unguе 2·8 mm. longo excluso. *Stamina* diadelpha, stamen posticum liberum, 8 mm. longum; filamenta antica dimidio inferiore connata; partes liberae alternae inaequales, 5 longiores 4·4·5 mm. longae, apice spongioso-clavatae, 4 breviores 2·5 mm. longae, antherae anguste oblongae, 0·5 mm. longae. *Ovarium* lineare, 6 mm. longum, superne secundum sutaram ventralem barbatum; ovula numerosa; stylus dente postico 0·6 mm. longo 1·5 mm. infra apicem orto munitus, stigmate oblique capitato. *Legumina* subcylindrica, cuspidata, 2–3 cm. longa, nitida.—*L. arenarius*, Webb et Berth. Phyt. Canar. vol. ii. p. 82; non Brot.—T. A. Sprague.

The subgenus *Pedrosia*, Brand, is readily distinguished from the rest of the genus *Lotus*, Linn., by the presence of a distinct tooth below the apex of the style. The distribution of the subgenus is circumscribed; that of the species *L. campylocladus*, a form of which is here figured, is of the "Atlantic" type, for it is confined to the Atlantic Islands, the Iberian Peninsula and Morocco.

March, 1915.

The specimens on which *L. campylocladus* was originally based were gathered near Guimar in Tenerife, and differ from the form of the species now depicted in the smaller, more obovate leaflets and the shorter subappressed indumentum. The form *villosior*, here described, was originally met with by the late Mr. P. Barker Webb at Fuencaliente in the south of Palma, and was identified by him as *L. arenarius*, Brot., though with an indication that he had long felt a doubt as to whether the Tenerife and the Palma plants should not be treated as varieties of one species. Specimens which have since been gathered at Guimar and elsewhere in Tenerife have shown how well-founded was the doubt thus expressed; it is found that these specimens form a connecting series within which it is impossible to distinguish even varieties. At the same time *L. campylocladus* is undoubtedly closely allied to *L. arenarius*, within which the form now figured was included by Webb; the best distinguishing mark is to be found in the more or less cuneate leaflets, retuse or subtruncate at the apex, which characterise the former. The form here termed *villosior* is widely distributed both in Tenerife and in Palma. In the latter island it was met with by Mr. Sprague and Mr. Hutchinson in the Gran Caldera in 1913. The plant from which our figure has been made was raised at Kew from seeds presented by Dr. G. V. Perez of Orotava. It is possible that the seed came in the first instance from Tenerife, for it appears that Dr. Perez received it under the name *L. mascaensis*, Burchard, a species known only from Tenerife. At Kew the species has been tried out of doors but does not give promise of being hardy. When grown in a frame it forms a plant about a foot in height, compact in habit and pleasing both in its flowers and in its silvery foliage.

Description.—*Herb*; root woody, branching from the base, with branching ascending stems woody below and shortly rather densely clothed with spreading hairs, as are the leaves and the calyces; internodes in cultivated plants $\frac{1}{3}$–1 in. long, in wild specimens up to 2 in. long. *Leaves* petioled, 3-foliolate; leaflets subsessile, cuneate, apex retuse or subtruncate, rarely rounded, in cultivated

plants $\frac{1}{8}$–$\frac{1}{4}$ in. long, $\frac{1}{12}$ in. wide or less, in wild plants nearly $\frac{1}{2}$ in. long, $\frac{1}{8}$ in. wide; petiole shorter than the leaflets; stipules leafy, as long as the petiole or longer, elliptic-oblong. *Umbels* rather long-stalked, 1-bracteate, capituliform, 3–5-flowered; peduncle $1\frac{1}{4}$–2 in. long, pedicels very short; bract sessile usually 1-foliolate, rarely 3-foliolate. *Calyx* narrowly campanulate, 2-lipped; lobes ascending, subulate-lanceolate, as long as the tube or longer, the two upper $\frac{1}{6}$ in. long, the three lower $\frac{1}{10}$–$\frac{1}{8}$ in. long. *Corolla* yellow with red streaks; standard-limb ovate, $\frac{1}{3}$ in. long, the claw about $\frac{1}{8}$ in. long, its margins inturned below almost at a right angle and cuneate for a short distance; wings cymbiform, auricled, over $\frac{1}{3}$ in. long excluding the claw which is $\frac{1}{10}$ in. long, the auricles and the margins slightly cohering below the apex, the auricles minute and very concave; keel-petals cuneate in front, slightly cohering behind, rostrate-cymbiform, about $\frac{1}{3}$ in. long excluding the claw which is nearly $\frac{1}{8}$ in. long. *Stamens* diadelphous, the posterior filament free, $\frac{1}{3}$ in. long; anterior filaments united in their lower half, their free portions alternately long and short, the five longer $\frac{1}{6}$ in. long, the four shorter $\frac{1}{10}$ in. long; anthers narrow-oblong, very short. *Ovary* linear, $\frac{1}{4}$ in. long, bearded above along the ventral suture; ovules many; style with a distinct posterior tooth a little way below the top; stigma obliquely capitate. *Pod* subcylindric, cuspidate, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, shining.

Fig. 1, leaf and stipules; 2, flower; 3, flower with the calyx opened and the petals removed; 4, a wing petal; 5, keel; 6, upper part of one of the long stamens; 7, pistil:—*all enlarged.*

M.S. del J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp

L. Reeve & Co. London

Tab. 8604.

THUNBERGIA Gibsonii.

Tropical East Africa.

Acanthaceae. Tribe Thunbergieae.

Thunbergia, *Linn. f.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1072.

Thunbergia Gibsonii, *S. Moore in Journ. Bot.* vol. xxxii. 1894, p. 131; species *T. alatae*, Boj., affinis, sed floribus majoribus intense aurantiacis facillime distinguenda.

Herba perennis, volubilis, 11 dm. alta, caulibus teretibus pilis longis patentibus vel leviter recurvis instructis. *Folia* ovata, apice acuta, basi sagittato-cordata, usque ad 7·5 cm. longa et 6 cm. lata, costa cum nervis lateralibus pagina superiore leviter impressa, inferiore prominente, utrinque aspera; petiolus circiter 3 cm. longus, leviter alatus, margine pilis patentibus instructus. *Flores* axillares, solitarii, pedunculo 10·5 cm. longo hirsuto-pubescente suffulti; bracteolae 2, attenuato-ovatae, apice acutae, basi cordatae, 3–3·5 cm. longae, 2 cm. latae, extra ferrugineo-hirsuto-pubescentes, intus glanduloso-pubescentes. *Calyx* cupularis, lobis circiter 12, extra glanduloso-pubescens, intus glaber, 5 mm. altus, 8 mm. diametro, basi epicalyce plano irregulariter lobato glanduloso instructus. *Corollae* tubus curvato-cylindricus, inferne abrupte angustatus, antice bisulcatus, circiter 3·5 cm. longus, apice 1·3 cm. diametro, basi 3 mm. diametro, intus lineis duabus hirsutis ornatus; limbus aurantiacus, lobis 5 patentibus ovato-triangularibus apice truncato-emarginatis, antico et lateralibus 2·2 cm. longis 2·1 cm. latis, posticis 1·9 cm. longis 1·9 cm. latis. *Stamina* 4, 4 mm. supra tubi basem inserta, filamentis longioribus 1·3 cm. longis, brevioribus 1 cm. longis, antheris 6·5 mm. longis basi pilis citroneis instructis; pollinis granula globosa. *Discus* cupularis, 0·75 mm. altus, oblique productus. *Ovarium* late ovoideum, medio constrictum, 2·5 mm. altum, usque ad 3 mm. diametro, glabrum, viride; stylus 1·9 cm. longus, superne leviter glandulosus et pubescens; stigma 3 mm. longum, bilobatum, lobo antico 5 mm. lato, postico 4 mm. lato.—W. B. Turrill.

The striking *Thunbergia* which forms the subject of our illustration is a native of tropical East Africa. The specimens on which the species, *T. Gibsonii*, was based are in the national collection at the British Museum, Cromwell Road, where they were received from a locality on the equator, approximately 36° 70′ east of the meridian of Greenwich, at an elevation of about 8000 feet above sea-level. Both as regards the corolla and bracteoles these original specimens, which consist of

flowers only, are rather larger than is the case in the plant from which our figure has been prepared, but there is no other difference discernible. The plant figured, which flowered at Kew in June, 1914, was acquired by purchase from Messrs. Thompson and Charman, Nurserymen, Bushey, according to whom it had been obtained from British East Africa from a locality 6000 feet above sea-level. The introduction appears to have been effected by Mr. W. van der Weyer, Corfe Castle, Dorset, by whom it was shown at an exhibition of the Royal Horticultural Society in May, 1913. The limb of the corolla is of a deep orange colour and waxy consistence, and the species is thereby readily distinguished from its nearest ally in the genus, the well-known *T. alata*, Boj., also originally a native of Tropical Africa, though now naturalised in some parts of South-eastern Asia, long ago figured at t. 2591 of this work. In habit a perennial, *T. Gibsonii* when grown in a pot under ordinary greenhouse conditions quickly develops leafy shoots which flower freely in summer.

Description.—*Herb*, perennial, twining, 4–5 ft. high; stems terete, beset with long spreading or slightly recurved hairs. *Leaves* ovate, acute, base cordate-sagittate, up to 3 in. long and $2\frac{1}{4}$ in. wide, midrib and lateral nerves somewhat sunk above, and raised beneath, harshly pubescent on both surfaces; petiole about $1\frac{1}{4}$ in. long, slightly winged, the margins beset with spreading hairs. *Flowers* axillary, solitary; peduncle over 4 in. long, hairy; bracteoles 2, narrow-ovate, acute, base cordate, $1\frac{1}{3}$–$1\frac{1}{2}$ in. long, $\frac{3}{4}$ in. wide, rusty-pubescent externally, glandular-pubescent within. *Calyx* cup-shaped; lobes about 12, glandular-pubescent outside, glabrous within, $\frac{1}{5}$ in. deep, $\frac{1}{8}$ in. across, with a flat, irregularly-lobed, glandular epicalyx at its base. *Corolla* tube curved-cylindric, abruptly narrowed downwards and 2-sulcate in front, about $1\frac{1}{2}$ in. long, over $\frac{1}{3}$ in. wide at the mouth, only $\frac{1}{8}$ in. wide at the base, with 2 longitudinal hirsute lines; limb orange, lobes 5, spreading, ovate-triangular with a truncate-emarginate apex, the anterior and lateral nearly an inch in length and width, the two posterior about $\frac{2}{3}$ in. long and broad. *Stamens* 4, $\frac{1}{6}$ in.

long, inserted above the base of the tube; filaments of the longer pair about $\frac{1}{2}$ in. long, of the shorter pair about $\frac{1}{3}$ in. long; anthers $\frac{1}{4}$ in. long, beset at the base by citron-yellow hairs; pollen globose. *Disk* cup-shaped, very short, produced obliquely. *Ovary* wide-ovoid, narrowed in the middle, $\frac{1}{10}$ in. long, up to $\frac{1}{8}$ in. wide, glabrous, green; style $\frac{2}{3}$ in. long, slightly glandular and pubescent upwards; stigma $\frac{1}{8}$ in. long, 2-lobed; anterior lobe $\frac{1}{5}$ in. wide, posterior lobe $\frac{1}{8}$ in. wide.

Fig. 1, calyx and pistil; 2, vertical section of calyx, showing ovary and disk; 3, base of corolla, laid open; 4 and 5, anthers:—*all enlarged.*

Vincent Brooks Day & Son Lith.p

L Reeve & Co London

Tab. 8605.

RHODODENDRON Davidsonianum.

China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron Davidsonianum, *Rehder et Wilson in Sargent, Plant. Wilson.* pars 3, p. 515 (1913); affinis *R. ambiguo*, Hemsl., sed foliis minoribus, floribus pallide roseis staminibus longioribus, filamentis minus pubescentibus differt.

Frutex 1–3 m. altus; rami divaricati, teretes, brunnei vel cinereo-brunnei, glabri; ramuli juniores breves, minutissime puberuli vel glabri. *Folia* lanceolata vel oblongo-oblanceolata, apice conspicue mucronata, basi obtusa vel leviter rotundata, 2·5–5·5 cm. longa, 1–2 cm. lata, rigide et firme chartacea, supra sicco conspicue reticulata et primum parce nigro-punctata, demum glabra, infra glandulis rotundatis parvis dense induta; costa supra plana, inconspicua, infra prominens, pallida, basi circiter 1 mm. lata, ad apicem sensim attenuata, in mucronem elongatum producta; nervi laterales supra subconspicui, arcuati, infra cum venis plerumque vix manifesti; petioli 3–5 mm. longi, interdum leviter puberuli. *Perulae* suborbiculares, submucronatae, coriaceae, dense ciliatae, extra glabrae. *Flores* terminales, circiter 6-nati; pedicelli 1–1·5 cm. longi, glandulis sessilibus rotundatis instructi. *Calyx* undulatus, brevissimus vel subnullus. *Corolla* pallide rosea, labio superiore flavo-lepidota; tubus circiter 1 cm. longus, sensim expansus, utrinque glaber; lobi 5, 4–4·5 cm. expansi, oblongi, apice rotundati, circiter 1·5 cm. longi et 0·6 cm. lati, subtiliter striati. *Stamina* 10, longe exserta; filamenta gracilia, usque ad 3 cm. longa, basin versus breviter pubescentia; antherae carmineae, 1·5–2 mm. longae. *Ovarium* conicum, dense lepidotum; stylus longe exsertus, gracilis, 3·5–4 cm. longus, glaber, stigmate undulatim lobato subcapitato coronatus. *Fructus* pro genere perbrevis, 1 cm. longus, 4 mm. diametro.—J. Hutchinson.

The Chinese *Rhododendron* of which a figure is here given is one of the fruits of Mr. E. H. Wilson's expedition of 1903–4, on behalf of Messrs. J. Veitch and Sons, the plant from which our illustration has been taken being one raised by them at Coombe Wood and acquired from them for Kew in 1908. During his later expeditions in China, Wilson again met with the species on several occasions. It is plentiful in the neighbourhood of Tachien-lu, in Western Szechuan. The nearest ally of *R. Davidsonianum* is, perhaps, *R. ambiguum*, Hemsl., another Chinese species figured at t. 8400 of this work.

It is most readily distinguished from the latter species by the more elegant habit, the smaller leaves, the differently coloured flowers and the more slender filaments. Like most of the Rhododendrons from China with scaly leaves, *R. Davidsonianum* gives promise of being very hardy. Its value as a garden plant will probably be similar to that of *R. yunnanense*, Franch., a Chinese species figured at t. 7614 of this work, and like that species it can be increased by means of late summer cuttings.

Description.—*Shrub*, 3½–10 ft. high; branches divaricate, terete, brown or greyish, glabrous; young twigs short, very finely puberulous or glabrous. *Leaves* lanceolate or oblong-lanceolate, with a markedly mucronate tip, base obtuse or slightly rounded, 1–2¼ in. long, ½–¾ in. wide, rigidly chartaceous, above at first sparingly black-dotted, at length glabrous and when dry strongly veined, beneath closely covered with small rounded glands; midrib flat above, inconspicuous, raised beneath, pale, gradually narrowed from base to tip, and prolonged into the long mucro; lateral nerves slightly visible above, arched, beneath hardly visible; petiole ⅛–½ in. long, sometimes faintly puberulous. *Bud-scales* suborbicular, slightly mucronate, coriaceous, densely ciliate, glabrous outside. *Flowers* terminal, about 6-nate; pedicels ½–⅝ in. long, covered with long rounded sessile glands. *Calyx* undulate, very short or nearly obsolete. *Corolla* pale rose, 1½–1¾ in. across, upper lip yellow-lepidote; tube about ⅓ in. long, slightly enlarged upwards, glabrous on both sides; lobes 5, oblong with rounded tips, about ⅔ in. long and ¼ in. wide, finely striate. *Stamens* 10, far exserted; filaments slender, up to 1¼ in. long, shortly pubescent near the base; anthers carmine, ⅛ in. long or less. *Ovary* conical, densely scaly; style far exserted, slender, 1½–1¾ in. long, glabrous, tipped by the undulately lobed subcapitate stigma. *Fruit* ⅓ in. long, ⅛ in. across.

Figs. 1 and 2, upper portions of leaves showing the conspicuous mucro; 3, scales from lower surface of leaves; 4, pistil and calyx; 5, stamen; 6 and 7, anthers:—*all enlarged*.

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Tab. 8606.

PRIMULA Miyabeana.

Formosa.

Primulaceae. Tribe Primuleae.

Primula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula (§ Candelabra) **Miyabeana**, *Ito et Kawakami in Miyabe Festschrift*, p. 1, t. xxix., a *P. Poissonii*, Franch., ejusque affinioribus calyce intus sulphureo-farinoso facile distinguenda.

Herba, an biennis. *Folia* oblongo-obovata vel late oblanceolata, apice juventute acuta, mox obtusa vel rotundata, basin versus paulo angustata, usque ad 20 cm. longa, plerumque 3–5 cm. lata, papyracea vel papyraceo-coriacea, pagina utraque glabra, superiore efarinosa, inferiore primo pallide farinosa, mox parcissime sulphureo-farinosa, deinde omnino efarinosa, nervis lateralibus utrinsecus circiter 10 inferioribus satis obliquis omnibus supra conspicuis subtus prominentibus, nervis transversis sparsis supra vix conspicuis subtus subprominulis, parte triente inferiore excepta irregulariter denticulata, primo parcius ciliolata, mox glabra. *Scapus* solitarius, folia multoties superans, ad 60 cm. altus, umbellas superpositas plerumque 6 10-floras gerens, apicem versus primo perparce farinosus, mox omnino efarinosus; bracteae ad 2 cm. longae; pedicelli usque ad 4 cm. longi, primo parcissime farinosi, mox efarinosi. *Calyx* sub anthesi 6 mm. longus, intus farinosus, lobis deltoideis vel anguste deltoideis acutiusculis tubo dimidio brevioribus nunc integris nunc denticulatis. *Corollae* purpureae tubus 14 mm. longus, ore annulatus; lobi obcordati, paulo ultra 5 mm. longi. *Filamenta* basi ampliata, antheris brevibus. *Fructus* in calyce purpurascente conspicue 5-costato lobis persistentibus erectis haud rarius foliaceis inclusus, ambitu oblongus vel globoso-oblongus, stylo persistente; semina parva, fusco-brunnea, papillosa.—*P. japonica*, A. Gray, var. *Miyabeana*, Ito in Encycl. Jap. vol. iv. p. 778. *Primula* sp., Kawakami, List Pl. Formos. p. 66. ? *Primula* sp., Hayata, Fl. Mont. Formos. p. 157.—W. G. Craib.

The section *Candelabra*, which owes its name to the type of inflorescence, is one of the most natural in the genus *Primula*. Its members are natives of eastern and south-eastern Asia; all of them appear to inhabit moist meadows, all produce rosettes of leaves which recall those of the Primrose, and all produce tall scapes with superposed tiers of flowers. All further agree in having a rounded or shortly oblong capsule enclosed in a slightly accrescent calyx. Within the section the species assort themselves in two groups, that in which the flowers are

purple, and that in which the flowers are yellow. In China, where the section has its headquarters, the number of species belonging to either group cannot yet be safely estimated; of those in cultivation the best known members of the group with yellow flowers are *P. Cockburniana*, Hemsl., *P. Bulleyana*, Forrest, and *P. serratifolia*, Franch.; the most familiar among those with purple flowers are *P. Beesiana*, Forrest, *P. Poissoni*, Franch., and *P. pulverulenta*, Duthie. The known species with yellow flowers which occur outside China are *P. imperialis*, Jungh., a native of Java which has the further interest attaching to most southern Asiatic species of the genus; *P. prolifera*, Wall., which occurs in the Khasia Hills, east of the Brahmaputra valley; and *P. Smithiana*, Craib, a native of Sikkim in the Eastern Himalaya. The extra-Chinese species with purple flowers so far known are *P. japonica*, A. Gray, which is restricted to Japan; and the subject of our illustration, *P. Miyabeana*, which is endemic in Formosa, and is readily distinguished from all the other known members of the section *Candelabra* in having the calyx farinose within. The plant figured is one which was raised from seed received at Kew in 1913 from Mr. W. R. Price, who met with the species on Mount Morrison in Formosa, growing at an elevation of 7000 feet above sea-level. The plant has been cultivated at Kew in a frame, where it flowered in May, 1914, and ripened its seeds in July. It may prove to be hardy, at least in the warmer districts of the British Islands. It will probably be best to treat it as a biennial under the conditions given to its near ally *P. Poissoni*, figured at t. 7216 of this work, like which it behaves under cultivation. A marked feature of the members of the section *Candelabra* is the readiness with which several of them lend themselves to hybridisation.

Description.—*Herb*, under cultivation apparently biennial. *Leaves* oblong-obovate or wide oblanceolate, when young acute, later obtuse or rounded, somewhat narrowed at the base, up to 8 in. long, from $1\frac{1}{4}$–2 in. wide, somewhat firmly papery, glabrous on both surfaces, beneath at first somewhat mealy, at length nearly or quite efarinose; lateral nerves about 10 on each side, the

lowest decidedly oblique, all visible above and raised beneath, with rather few transverse veins hardly visible above, but slightly raised beneath; margin irregularly denticulate except at the entire base, at first somewhat sparingly ciliolate, soon glabrous. *Scape* single, much longer than the leaves, up to 2 ft. in height, bearing several 6–10-flowered superposed whorls, at first sparingly mealy near the top, soon quite efarinose throughout; bracts $\frac{1}{2}$–$\frac{3}{4}$ in. long; pedicels up to $1\frac{1}{2}$ in. long, at first sparingly mealy, soon efarinose. *Calux* in flower $\frac{1}{4}$ in. long, mealy within; lobes deltoid or narrow-deltoid, rather acute, shorter than the tube, at times entire, at times denticulate. *Corolla* purple; tube over $\frac{1}{2}$ in. long, with annulate mouth; lobes obcordate, nearly $\frac{1}{4}$ in. long. *Filaments* broad-based; anthers short. *Capsule* oblong or globose-oblong, tipped by the persistent style and enclosed in the purplish, distinctly 5-costate fruiting calyx, the lobes of which are persistent, erect and not infrequently leafy; seeds small, tawny-brown, papillose.

Fig. 1, calyx with denticulate lobes, enclosing pistil; 2, calyx with entire lobes, in vertical section, disclosing the pistil; 3, corolla in vertical section, showing staminal insertion; 4, two fruits, showing the dimorphic calyx; 5, a single fruit enclosed in a calyx with denticulate lobes; 6, sketch of the entire plant, showing habit:—*all enlarged except* 4, *which is of natural size, and* 6, *which is much reduced.*

Tab. 8607.

ACANTHOPANAX leucorrhizum.

Central China.

Araliaceae. Tribe Panaceae.

Acanthopanax, *Dene et Planch.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 938, ampl.; *Harms in Engl. & Prantl, Nat. Pflanzenf.* vol. iii. pars 8, p. 50.

Acanthopanax leucorrhizum, *Harms l.c.*; *C. K. Schneid. in Handb. d. Laubholzk.* vol. ii. pp. 424, 1040; *Bean in Trees and Shrubs*, vol. i. p. 130, cum icon.; species *A. Henryi*, Harms et *A. Simonii*, C. K. Schneid. quam maxime affinis ab ambobus tamen aculeis longioribus tenuioribus et foliolis glabris differt.

Frutex glaber, 1·5–3-metralis; ramuli valde medullosi, pallide lenticellati, ad nodos verticillatim aculeis 1–6 pallidis decurvis subulatis pungentibus 3–8 mm. longis armati, inter nodos parcissime aculeati vel inermes. *Folia* decidua, alterna, 5–3-foliolata; foliola lanceolata vel oblanceolata, acuminata, basi cuneata, margine argute duplo-serrata, 5–12 cm. longa, 1·3–4 cm. lata, petiolulis 3–8 mm. longis suffulta; petioli 3·5–10 cm. longi, interdum parce aculeati. *Flores* viridi-florescentes, umbellati, 4 mm. lati, pedicellis gracilibus glabris 1·2–1·8 cm. longis suffulti; umbellae 60–90-flores, singulae vel paucae corymbosim aggregatae, terminales, globosae, 4–5 cm. latae; pedunculi 3·5–10 cm. longi. *Calyx* 5-dentatus, dentibus minutis triangularibus. *Petala* 5, ovata, acuta, 3 mm. longa, deflexa, margine apiceque incurva. *Stamina* 5; filamenta glabra, 3 mm. longa; antherae exsertae. *Bacca* nigro-purpurea, globosa vel oblonga, 6–8 mm. longa, stylo brevi persistente coronata; caro sucosa; sucus tinctorius atramentum referens. *Semina* compressa, semi-elliptica, 6 mm. longa, 2 mm. lata.—*Eleutherococcus leucorrhizus*, Oliv. in Hook. Icon. Pl. sub t. 1711.—W. J. Bean.

The Araliad here figured was originally described by Professor Oliver from specimens discovered by Professor A. Henry in the province of Hupeh in Central China about 1886. It was met with again in the same region by Mr. E. H. Wilson in 1901, and through his agency was introduced to cultivation by Messrs. J. Veitch and Sons. The plant which has supplied the material for our illustration is one at Kew which was purchased from Messrs. Veitch in 1913. When first described the species was referred with justice to the genus *Eleutherococcus*, based by the late Mr. Maximowicz on a species from

Manchuria. More recently, however, Dr. Harms has proved satisfactorily that this genus is not in reality separable from the older genus *Acanthopanax*. In gardens *A. leucorrhizum*, here depicted, has been confused with *A. Simonii*, C. K. Schneid.; the figure which was published in the Gardeners' Chronicle on 9 December, 1905 (fig. 152), under the name *Eleutherococcus leucorrhizus* is not the plant now described, but is really *A. Simonii*. The plant there referred to is well distinguished from the true *A. leucorrhizum* by its much stouter hooked spines distributed irregularly on the branchlets and by the numerous bristles on both surfaces of the leaflets. Another species very closely allied to the subject of our plate is *A. Henryi*, Harms, already described at t. 8316 of this work, which differs from *A. leucorrhizum* in having shorter, stouter spines, shorter pubescent pedicels and pubescent leaves. The bark of the roots of *A. leucorrhizum*, from the appearance of which the specific name has been derived, is stated by Henry to be used by the Chinese as a drug, known to them as the White "Wu Chia P'i." As a shrub for gardens, *A. leucorrhizum* will be valued chiefly for its handsome foliage, of a type uncommon among hardy shrubs, and for its striking umbels of purple-black berries which are produced very abundantly and remain on the bushes late into the autumn. It has withstood perfectly the frosts experienced since its introduction, and although these have not provided the hardest tests of our climate we may reasonably assume it to be hardy. It thrives in well-drained sandy loam and is easily propagated by seeds.

Description.—*Shrub*, 6–10 ft. high, everywhere glabrous; branchlets very pithy, sprinkled with pale lenticels, armed at the nodes with 1–6 pale, decurved spines $\frac{1}{8}$–$\frac{3}{8}$ in. long, sharply pointed and subulate; internodes at times with a few similar but scattered spines. *Leaves* deciduous, alternate, usually 5-foliolate, sometimes 3-foliolate; leaflets lanceolate or oblanceolate, apex acuminate, base acute, margin sharply doubly serrate, 2–5 in. long, $\frac{1}{2}$–$1\frac{3}{4}$ in. wide, their petiolules $\frac{1}{8}$–$\frac{3}{8}$ in. long; petioles $1\frac{1}{2}$–4 in. long, occasionally armed with one or two prickles, especially where the petiolules are attached.

Flowers yellowish-green, each $\frac{3}{16}$ in. across, crowded in globose 60–90-flowered terminal umbels, each $1\frac{1}{2}$–2 in. across, which may be solitary or several together in a corymbose cluster; peduncles $1\frac{1}{2}$–4 in. long. *Calyx* 5-toothed, the teeth minute, triangular. *Petals* 5, ovate, acute, $\frac{1}{8}$ in. long, deflexed, their margin and apex incurved. *Stamens* 5; filaments glabrous, $\frac{1}{8}$ in. long; anthers exserted. *Fruit* a purplish-black, globose to oblong berry, $\frac{1}{4}$–$\frac{3}{8}$ in. long, terminated by the short, persisting style. *Seeds* compressed, semi-elliptic, $\frac{1}{4}$ in. long, $\frac{1}{12}$ in. wide, embedded in the black juicy pulp which stains like ink.

Fig. 1, flower; 2, calyx and pistil; 3 and 4, anthers; 5, fruit; 6, a seed:—*all enlarged.*

M.S.del. J.N.Fitch lith.

Vincent Brooks, Day & Son Lith. Imp.

L. Reeve & Co. London

Tab. 8608.

IRIS Urumovii.

Bulgaria.

Iridaceae. Tribe Irideae.

Iris, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 686.

Iris Urumovii, *Velenovsky in Oestr. Bot. Zeitschr.* vol. lii. (1902), p. 155; *Dykes in Gard. Chron.* 1914, vol. lvi. p. 272; affinis *I. Sintenisii*, Janka, sed foliis glaucis paucinerviis asperulis hieme absumptis, spathis multo laxius nervosis asperulis, perigonii tubo breviore distincta.

Herba rhizomate oblique descendente brunneo vix digiti minoris crassitie. *Caules* plures, 10–12 cm. alti, tota vel fere tota longitudine foliis inclusi, basi foliorum vetustorum residuis fuscis cincti. *Folia* 5–6 cum quoque caule, sub anthesi flores vix attingentia, deinde elongata, ad 25 cm. longa, 3–4 mm. lata, linearia, acuta vel acutissima, glauca, laxe nervosa, in nervis papillis albis majusculis asperula. *Spathae* 2–3, herbaceae, glauco-virides, acutae vel subacutae, 6–7 cm. longae, circiter 6 mm. latae, apicem versus carinatae, nervatione asperitate foliorum. *Perigonium* pedicello ovario aequilongo suffultum; tubus 1 cm. longus, superne ampliatus; segmenta exteriora limbo leviter deflexo late ovato circiter 1 cm. longo in fundo albo coeruleo-purpureo-venoso venis ad margines confluentibus sensim in unguem cuneato-linearem abeunte, tota 2·5–3 cm. longo; segmenta interiora suberecta, oblanceolata, obtusa, purpurea, 2·5 cm. longa, 8 mm. lata. *Antherae* luteae, 1 cm. longae. *Ovarium* 1·25 cm. longum, in tubum perigonii attenuatum; styli rami late lineares, crista subquadrata lobis obscure crenulatis.—O. Stapf.

The *Iris* here figured was discovered by Professor J. K. Urumov at Eski Dzumaja in Bulgaria in 1901. In his monograph it was referred by Mr. W. R. Dykes to *I. Sintenisii*, Janka, but, on raising plants from seeds obtained from Messrs. Vilmorin, Mr. Dykes recognised it as distinct. This decision has been confirmed by a plant received by the Hon. N. C. Rothschild from the original locality in Bulgaria. The difficulty experienced has been due to the original description. Dr. Velenovsky has described the plant as having green leaves and greenish spathes, but these organs, as Mr. Dykes points out, are glaucous, this colour being enhanced by the fairly large white asperities on the nerves. The dimensions here given have been

derived from the specimen, sent by Mr. Dykes, which has served for our plate. But the stems may attain a height of 6–10 inches, while the leaves may be 18 inches long and a quarter of an inch wide, and the spathes may be over 4 inches in length. On the other hand Velenovsky's plants had leaves one-twelfth of an inch across or under, while according to him the falls may measure as much as an inch and a half in length by an eighth to a sixth of an inch in width. Mr. Dykes finds that this species is as easy to grow in his garden at Godalming as the well-known *I. graminea*. It loses its foliage in the autumn, and it is not until the end of January that the glaucous tips of the leaves appear. It is not fastidious as to soil and has done well in sand enriched with leaf mould and chalk, but Mr. Dykes believes that it might grow even better in a stiffer loam overlying chalk. It should be moved, if necessary, either immediately the flowers are over or when growth becomes active in spring, but not in the autumn when the plant is dormant.

DESCRIPTION.—*Herb*, rootstock brown, oblique, hardly as thick as a little finger. *Stems* several, 4–5 in. high, from almost to quite enveloped by the leaves, their bases surrounded by the dry remains of the old foliage. *Leaves* 5–6 to a stem, at flowering time barely reaching the blossoms, thereafter elongating and at length 10 in. long, $\frac{1}{8}$–$\frac{1}{6}$ in. wide, linear, acute or very acute, glaucous, laxly nerved, the nerves rough with rather large white papillae. *Spathes* 2–3, herbaceous, glaucous-green, acute or subacute, $2\frac{1}{2}$–$2\frac{3}{4}$ in. long, about $\frac{1}{4}$ in. wide, keeled towards the tip, with rough nerves like the leaves. *Perianth* with a pedicel as long as the ovary; tube over $\frac{1}{3}$ in. long, widened upwards; outer segments 1–$1\frac{1}{4}$ in. long, with a wide-ovate slightly deflexed limb over $\frac{1}{3}$ in. long, gradually narrowed into a linear cuneate claw, with bluish-purple veins in the white base, the veins confluent towards the margins; inner segments 1 in. long, $\frac{1}{3}$ in. wide, suberect, oblanceolate, obtuse, purple. *Anthers* yellow, over $\frac{1}{3}$ in. long. *Ovary* over $\frac{1}{2}$ in. long, narrowed into the perianth-tube; style-arms wide-linear; crest subquadrate with faintly crenulate lobes.

Figs. 1 and 2, anthers; 3, stigma:—*all enlarged.*

Tab. 8609.

GENTIANA barbata, forma grandiflora.

Siberia.

Gentianaceae. Tribe Swertieae.

Gentiana, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 815.

Gentiana barbata, *Froelich*, forma grandiflora, *Freyn in Oestr. Bot. Zeitschr.* vol. xlv. p. 468; a planta typica floribus majoribus 6–8 cm. longis differt.

Herba annua, suberecta vel adscendens, caulibus simplicibus vel plus minusve ramosis teretibus bisulcatis glabris. *Folia* lineari-lanceolata, acuta vel acuminata, usque ad 6 cm. longa et 9 mm. lata, costa pagina superiore impressa inferiore prominente, nervis lateralibus pagina utraque obscuris, glabra, sessilia. *Flores* solitarii, pedunculo usque ad 1 dm. longo subterete glabro suffulti. *Calyx* viridis, glaber, 5–6 cm. longus, segmentis 4 inter se inaequalibus, duobus exterioribus lineari-lanceolatis longe acuminatis 4·2 cm. longis 8 mm. latis, duobus interioribus ovato-lanceolatis acuminatis 3 cm. longis 1 cm. latis. *Corolla* 6–8 cm. longa, glabra; tubus viridis, superne leviter ampliatus, basi 4 mm., apice 1·2 cm. diametro, basin versus glandibus 5 sessilibus staminibus alternatis instructus; segmenta 4, patentia, obovato-triangularia, apice subacuta, basi angustata, infra medium fimbriata, ima basi integra, 3·8 cm. longa, 2·5 cm. lata, extra viridia, intus coerulea. *Stamina* 4, filamentis 1·5 cm. longis medio 2·75 mm. latis glabris decurrentibus, antheris 3 mm. longis. *Ovarium* fusiforme, 4 mm. altum, medio 4 mm. diametro, glabrum.—W. B. Turrill.

The fine Gentian here figured belongs to a group of forms for which it is hard to find limiting characters, and there is a fairly complete series of forms transitional between small northern examples of *Gentiana detonsa*, Rottb., a species to which our plant is closely allied and within which it is at times included, and the form with large and beautiful flowers represented in our illustration. The plant originally described as *G. detonsa* from specimens obtained in Norway and perhaps also in Iceland is characterised by its quadrifid corolla with crenulate lobes neither barbate nor fimbriate on the margin below the middle, as well as by having erect stems. The plant which Froelich first described as *G. barbata* is usually considerably larger than typical *G. detonsa*, with which it agrees in its quadrifid corolla. It is a native of Siberia and the Caucasus, and in spite of general agreement with *G. detonsa* is readily distinguished by its often

ascending but not strictly erect stem, by its more acute or acuminate leaves, and especially by the corolla lobes, which are fimbriate on the margin just below the middle. This typical condition of *G. barbata* has already been figured at t. 639 of this work as *G. ciliata*, which name, however, belongs to another species. The form now figured differs from typical *G. barbata* chiefly in having a larger corolla and longer, more acuminate sepals. The plant figured was raised from seed received from the Royal Botanic Garden, Edinburgh, in 1912,and flowered at Kew in September, 1914. This form is hardy and has behaved as a biennial, all the plants having died soon after flowering; a few seeds, however, were ripened. It thrives well in ordinary garden soil and prefers partial shade.

Description.—*Herb*, annual, almost erect or more often ascending; stems simple or somewhat branched, terete, 2-sulcate, glabrous. *Leaves* linear-lanceolate, acute or acuminate, up to $2\frac{1}{4}$ in. long, over $\frac{1}{3}$ in. wide, midrib impressed above, raised beneath, the lateral nerves hardly visible on either surface, glabrous, sessile. *Flowers* solitary; peduncle subterete, glabrous, up to 4 in. long. *Calyx* green, glabrous, 2–$2\frac{1}{4}$ in. long; lobes 4 in two unequal pairs, the two outer linear-lanceolate, long acuminate, $1\frac{3}{4}$ in. long, $\frac{1}{3}$ in. wide, the two inner ovate-lanceolate, acuminate, $1\frac{1}{4}$ in. long, $\frac{1}{5}$ in. wide. *Corolla* $2\frac{1}{2}$–3 in. long, glabrous; tube green, slightly enlarged upwards, $\frac{1}{6}$ in. wide at the base, $\frac{1}{2}$ in. wide at the mouth, with 5 sessile basal glands alternating with the stamens; lobes 4, spreading, obovate-triangular, subacute, narrowed to the base, their margin fimbriate below the middle but entire again at the base, $1\frac{1}{2}$ in. long, 1 in. wide, green outside, blue within. *Stamens* 4, filaments $\frac{2}{3}$ in. long, nearly $\frac{1}{8}$ in. wide about the middle, glabrous, decurrent on the corolla; anthers $\frac{1}{8}$ in. long. *Ovary* fusiform, $\frac{1}{6}$ in. long, and in the middle near $\frac{1}{6}$ in. across.

Fig. 1, calyx laid open and pistil; 2, longitudinal section of corolla, showing staminal insertion; 3, gland of corolla-tube, alternating with stamens; 4 and 5, young stamens, with anthers introrse; 6, older stamen, showing anther which is now reversed and extrorse:— *all enlarged.*

M.S. del. Lith. Parkinson

Vincent Brooks Day & Son Lith.

L. Reeve & Co. London

Tab. 8610.

ZYGOPETALUM Prainianum.

Peru.

Orchidaceae. Tribe Vandeae.

Zygopetalum, *Hook.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 542.

Zygopetalum Prainianum, *Rolfe in Kew Bulletin*, 1914, p. 376; *Gard. Chron.* 1914, vol. lvi. p. 195; *Orch. Rev.* 1914, p. 317; affinis *Z. Burkei*, Reichb. f., sed pseudobulbis longioribus, foliis latioribus, et colore florum differt.

Herba terrestris. *Pseudobulbi* anguste oblongi, basi paullo incrassati, sulcati, 3–10 cm. longi, apice 2–3-phylli. *Folia* elongato-lanceolata vel elongato-oblonga, subacuta, 25–35 cm. longa, 1·5–3 cm. lata, subcoriacea. *Scapi* erecti, circiter 60 cm. longi, basi vaginis spathaceis obtecti, 4–5-flori; bracteae ovato-oblongae, subacutae, conduplicato-concavae, 1·5–2 cm. longae; pedicelli 3–4 cm. longi. *Flores* speciosi. *Sepala* et *petala* patentia vel subreflexa, lanceolato-oblonga, subacuta, subcarnosa, circiter 2·5 cm. longa, 1 cm. lata. *Labellum* subpatens, pandurato-oblongum, subacutum, 2 cm. longum, 1·5 cm. latum, prope apicem subincurvum et crenulatum, basi callo crasso dentato instructum. *Columna* clavata, incurva, 1·5 cm. longa; alae triangulari-oblongae, subincurvae, 4 mm. longae. *Pollinia* 4, obovoidea, subcompressa; stipes squamiformis, glandula cordata.—R. A. Rolfe.

The very interesting *Zygopetalum* which is the subject of our plate is one of the Peruvian discoveries of Mr. L. Forget when collecting in South America on behalf of Messrs. F. Sander and Sons. The plant flowered for the first time in their collection at St. Albans in September, 1914, and was then purchased from them for Kew. Its nearest ally appears to be *Z. Burkei*, Reichb. f., a native of Mount Roraima in British Guiana, the two species being extremely like each other as regards the shape of the labellum. They are, however, readily distinguished by their pseudobulbs and leaves which are considerably larger in the Peruvian than in the Guiana plant. They also differ as regards the colour of their flowers, there being fewer green markings on the petals of the species here described. The treatment suitable for the stronger species of *Zygopetalum*, such as *Z. crinitum* or *Z. intermedium*, is found to be well adapted to the needs of *Z. Prainianum* also.

May, 1915.

DESCRIPTION.—*Herb*, terrestrial; pseudobulbs narrowly oblong, slightly thickened at the base, sulcate, $1\frac{1}{2}$–4 in. long, 2–3-foliate at the apex. *Leaves* elongate-lanceolate or -oblong, subacute, 10–14 in. long, $\frac{2}{3}$–$1\frac{1}{4}$ in. wide, subcoriaceous. *Scapes* erect, about 2 ft. long, clothed below with spathe-like sheaths, 4–5-flowered; bracts ovate-oblong, subacute, conduplicate-concave, $\frac{2}{3}$–$\frac{3}{4}$ in. long; pedicels $1\frac{1}{4}$–$1\frac{3}{4}$ in. long. *Flowers* showy. *Sepals* and *petals* spreading or slightly reflexed, lanceolate-oblong, subacute, somewhat fleshy, about 1 in. long, $\frac{2}{5}$ in. wide. *Lip* somewhat spreading, pandurate-oblong, subacute, $\frac{3}{4}$ in. long, $\frac{2}{3}$ in. wide, slightly incurved and crenulate at the tip, and with a stout toothed callus at the base. *Column* clavate, incurved, $\frac{2}{3}$ in. long, the wings triangular-oblong, somewhat incurved, $\frac{1}{6}$ in. long. *Pollinia* 4, obovoid, somewhat compressed; stipe scale-like, with a cordate gland.

Fig. 1, crest of the lip; 2, column; 3 and 4, pollinarium seen from in front and from behind:—*all enlarged.*

M.S. del. J.N. Fitch, ad. nat.

Vincent Brooks, Day & Son, Lith.

L. Reeve & Co., London.

Tab. 8611.

AMELANCHIER florida.

North America.

Rosaceae. Tribe Pomeae.

Amelanchier, *Medic.*; *Lindl. in Trans. Linn. Soc.* vol. xiii. p. 100; *Benth. et Hook. f. in Gen. Plant.* vol. i. p. 628.

Amelanchier florida, *Lindl. in Bot. Reg.* vol. xix. t. 1589 (1833); *Wiegand in Rhodora*, vol. xiv. (1912) p. 143; species *A. alnifoliae*, Nutt., proxime accedens sed habitu frutescente foliisque pluridentatis apte distinguenda.

Frutex deciduus, 1–3-metralis; caules erecti, graciles, caespitosi; novelli primum tomentosi, demum glabri. *Folia* ovata, ovalia vel orbicularia, 2–4·5 cm. longa, 1·25–4·5 lata, acuta vel truncata, basi rotundata vel minopere cordata, margine versus basin integra ceterum grosse arguteque serrata, supra viridia, subtus pallida, juvenilia parcissime tomentosa, matura glabra; nervi laterales utrinsecus 9–12; petiolus 5–20 mm. longus. *Flores* albi, 2–2·5 cm. lati, racemosi; racemi erecti, 2·5–5 cm. longi, sub-8-flori, ramulos foliatos breviores terminantes; rhachis glabra vel primum parce tomentosa, 9–12 mm. longa; pedicelli glabri. *Calyx* hypocrateriformis, 4 mm. latus, 5-lobus, glaber vel parce tomentosus; lobi anguste triangulares, acuti, 2–4 mm. longi, intus parce floccosi. *Petala* 5, oblongo-obovata, apice rotundata, circiter 9 mm. longa, 4·5 mm. lata. *Stamina* numerosa antheris luteis. *Fructus* ovoideus vel globosus, 6–8 mm. longus, calycis lobis persistentibus demum recurvis coronatus; maturus niger purpureo-pruinosus.—*A. oxyodon*, Koehne in Gartenfl. 1902, p. 609. *A. alnifolia*, var. *florida*, C. K. Schn. Ill. Handb. Laubholzk. vol. i. p. 739.—W. J. Bean.

Introduced originally by David Douglas from Western North America about 1826, *Amelanchier florida* has probably been in cultivation during most of the period that has elapsed since then, although latterly it has been confounded with *A. alnifolia*, Nutt., both in gardens and in botanical works. Growing together, as these two species are at Kew, they are seen to be quite distinct. *A. alnifolia* is a small tree; *A. florida* is a caespitose shrub, its slender erect stems forming quite a thicket. The leaves of *A. florida* are toothed farther down the margin; the hypanthium is much less woolly or even quite glabrous on the outside; and it flowers in early May about a fortnight in advance of *A. alnifolia*. The plant from which our plate was prepared was obtained from a continental nursery in 1906 as *A. oxyodon*, but a com-

parison with Lindley's type, preserved at Cambridge, leaves us in no doubt that Koehne's name must be reduced. *A. florida* grows freely at Kew, and flowers regularly and profusely every year. It is a charming shrub, easily accommodated and thriving well in loamy soil, useful for situations where *A. alnifolia* and *A. canadensis* might be too large. It produces good seeds freely under cultivation and by them is readily propagated. *A. florida* appears to be one of the most widely spread of North American Amelanchiers. It is found in wooded districts of British Columbia, Oregon and Washington, extending southwards to Nevada and eastwards as far as Michigan.

DESCRIPTION.—*Shrub*, from 4 to 10 ft. high, forming a cluster of erect, slender stems; young shoots tomentose at first, soon quite glabrous. *Leaves* deciduous, varying from ovate to oval and orbicular, and from $\frac{3}{4}$ to $1\frac{3}{4}$ in. long by $\frac{1}{2}$ to $1\frac{3}{4}$ in. wide, rounded to slightly cordate at the base, acute to truncate at the apex; margin entire towards the base, coarsely and sharply serrate at the terminal one- to two-thirds; green above, pale beneath, quite glabrous except when unfolding, then slightly tomentose; lateral nerves in from nine to twelve pairs; petiole $\frac{1}{4}$ to $\frac{3}{4}$ in. long. *Racemes* erect, 1 to 2 in. long, terminating short leafy twigs and carrying about eight flowers. *Flowers* white, $\frac{3}{4}$ to 1 in. wide. *Pedicels* and *rachis* glabrous or slightly tomentose at first, the former $\frac{3}{8}$ to $\frac{1}{2}$ in. long. *Hypanthium* saucer-shaped, $\frac{1}{6}$ in. wide, glabrous to slightly tomentose; sepals narrowly triangular, acute, 1 to 2 lines long, persistent and finally recurved in fruit, inner surface slightly floccose. *Petals* 5, oblong-obovate, rounded at the apex, about $\frac{3}{8}$ in. long and $\frac{3}{16}$ in. wide. *Stamens* numerous; *anthers* yellow. *Fruit* ovoid to globose, $\frac{1}{4}$ to $\frac{1}{3}$ in. long, at maturity black with a purple bloom.

Fig, 1, flower with petals removed; 2, section of the same; 3, section of ovary; 4, fruit; 5, seed:—*all enlarged.*

Tab. 8612.

PRIMULA pycnoloba.

Szechuan.

Primulaceae. Tribe Primuleae.

Primula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula pycnoloba, *Bur. et Franch. in Journ. de Bot.* vol. v. p. 99; *Pax et Knuth in Engl. Pflanzenr.-Prim.* p. 23; *Balf. f. in Journ. Roy. Hort. Soc.* vol. xxxix. p. 144, fig. 47; ob calycem bene evolutum corollam superantem facile distinguenda.

Herba ab radice pullulans. *Folia* late cordata vel ovato-cordata, usque ad 14 cm. longa lataque, crassius membranacea, pagina superiore magis minusve bullata, pilis albidis hic illic instructa, inferiore pallidiora, secus nervos pilis longis albidis subflaccidis densius ornata, e basi 5-nervia, nervis secundariis e costa ortis utrinsecus 4–5, omnibus ad marginem excurrentibus infra prominentibus, margine lobulata, lobulis rotundatis irregulariter parcius denticulata, ciliata; petiolus lamina nunc parum longior, nunc parum brevior, densius lanuginosus. *Scapus* usque ad 20 cm. altus, racemum submultiflorum suffulciens, lanuginosus; bracteae foliaceae pedicellos superantes, oblanceolatae vel late oblanceolatae, apice acutae, basi excepta pauci-serratae; pedicelli circiter 2 cm. longi. *Calyx* primo lobis erectis turbinatus, lobis mox patulis, extra praecipue versus basin pilis longis albis, intus pilis brevibus albis instructus; tubus 1·3–1·7 cm. longus; lobi 5–6, late lanceolati vel ovato-lanceolati, apiculati, 10–14 mm. longi, 5–6·5 mm. lati, integri vel irregulariter serrulati, interdum bifidi. *Corollae* tubus 14·5 mm. longus, 2·75 mm. diametro, extra pilis albis brevibus perpaucisque longioribus additis instructus; lobi 5–6, oblongi, retusi, 4 mm. longi, 3 mm. lati. *Antherae* parvae. *Ovarium* subglobosum, 2 mm. altum, stylo glabro, stigmate conspicuo capitato.—W. G. Craib.

The *Primula* now figured is a native of the western districts of Szechuan in South-west China. It was first met with in 1890 in the neighbourhood of Ta-tsien-lu by Prince Henri d'Orleans and his companion Mr. Bonvalot, and was originally described from their specimens by Professor Bureau and the late Mr. Franchet. It was met with again in the same neighbourhood in 1906 by Mr. E. H. Wilson when collecting on behalf of Messrs. J. Veitch and Sons, and was introduced to horticulture by them from seeds received from Wilson. The plant from which our plate has been prepared was presented to Kew by Messrs. Veitch in 1912, and flowered in the Alpine Collection in 1913. As a species *P. pycnoloba*

stands in marked contrast to many of the forms, and more especially to those whose home is in Western and Southern China, which have been recognised within the genus *Primula*, in exhibiting characters which admit of its unqualified recognition. But if there is in this case no question as to the claim of our plant to specific rank, its position within the genus has been the subject of some debate. Professor Pax and his fellow-worker Dr. Knuth have treated it as a member of the section which includes the familiar *P. sinensis*, Sabine, already figured in this work. Professor Bayley Balfour, however, in his more recent scholarly study of the Chinese members of this difficult genus has advanced good reasons for the view that the *Sinenses* of Pax and Knuth should be regarded rather as an aggregate of natural groups or sections, of one of which, the section *Pycnoloba*, the species now described is the type and the sole representative. *P. pycnoloba* thrives well under ordinary alpine treatment in a shaded portion of the Rock Garden, and so far has not been injured by cold at Kew. It can also be successfully grown in pots in a cold frame. At Edinburgh, Professor Balfour states, it is easily grown if protected from overhead moisture when resting; it spreads rapidly in the soil by means of its root-buds, which afford a ready means of propagation. It may be remarked here that the plant now figured suggests that it represents an unusually vigorous strain; at all events it has more numerous flowers and rather broader calyx-lobes.

Description.—*Herb*, spreading by means of root-buds. *Leaves* broadly cordate or ovate-cordate, up to 6 in. across, rather thickly membranous, more or less bullate above, with a few scattered white hairs, paler beneath and rather closely hirsute with long rather soft white hairs on the nerves, 5-nerved from the base, secondary nerves from the midrib 4–5 on each side, all excurrent and all raised beneath, margin lobulate, the lobules rounded and irregularly sparingly denticulate, ciliate; petiole at times rather longer than the blade, at times somewhat shorter, downy. *Scape* up to 8 in. long, downy, with a rather close-flowered terminal raceme;

bracts leafy, longer than the pedicels, oblanceolate or wide-oblanceolate, acute, sparingly serrulate except near the base; pedicels about $\frac{3}{4}$ in. long. *Calyx* turbinate, its lobes at first erect but soon spreading, with long white hairs especially near the base outside, uniformly clothed with short white hairs within; tube $\frac{1}{2}$–$\frac{2}{3}$ in. long; lobes 5–6, wide-lanceolate or ovate-lanceolate, apiculate, $\frac{1}{3}$–$\frac{1}{2}$ in. long, $\frac{1}{5}$–$\frac{1}{4}$ in. wide, entire or irregularly serrulate, sometimes 2-fid. *Corolla* dark pink; tube under $\frac{2}{3}$ in. long, about $\frac{1}{8}$ in. wide, clothed outside with short white hairs but with a few longer intermixed; lobes 5–6, oblong, retuse, $\frac{1}{6}$ in. long, $\frac{1}{8}$ in. wide. *Anthers* small. *Ovary* subglobose, $\frac{1}{12}$ in. long; style glabrous; stigma rather large, capitate.

Fig. 1, corolla in longitudinal section, showing the anthers; 2, pistil:—*both enlarged.*

Tab. 8613.

ARISTOLOCHIA longecaudata.

Tropical South America.

Aristolochiaceae.

Aristolochia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 123.

Aristolochia longecaudata, *Mast. in Mart. Flor. Bras.* vol. iv. pars 2, p. 84, *et in Gard. Chron.* 1890, vol. viii. p. 493, fig. 98, *non S. Wats.*; species *A. Lepricurii*, Duchartre, affinis, perianthii tubo infra oblique inflato differt.

Herba perennis. *Caulis* scandens, pilis brevibus sparsim instructus. *Folia* integra vel lobata, plus minusve ovata vel oblonga, acuta vel acuminata, basi cordata, usque ad 11 cm. longa, 2–6 cm. lata, supra glabra, subtus minute denseque pubescentia, trinervia, nervis lateralibus lamina quadrante brevioribus, venulis dense reticulatis; petiolus 4 cm. longus, pubescens. *Flores* solitares, axillares; pedicelli 3 cm. longi, pubescentes. *Perianthium* dilute cremeum, extra brunneo-reticulatum et striatum, parte basali oblique inflato 4·5 cm. longo circiter 2·5 cm. diametro intus areis duabus lateralibus albo-arachnoideis instructo, fauce intus pilis brunneis dense vestita; lobus e basi 3 cm. lata ad apicem gradatim attenuatus, 20 cm. longus, spiraliter tortus. *Stamina* 6; antherae cereo-flavae. *Ovarium* 3 cm. longum, pubescens, leviter sulcatum; styli rami 6, obtusi. —C. H. Wright.

The Birthwort which is the subject of our illustration as first described by the late Dr. Maxwell Masters from herbarium specimens collected by Mr. Appun in British Guiana. It was alluded to again by Masters in the Gardeners' Chronicle in 1890, his note being accompanied by a figure based on a plant introduced from Demerara and flowered at North Cray by Mr. Todd. The present figure has been prepared from a plant presented to Kew in June, 1913, by the Rev. A. Miles-Moss who first met with this and several other species of *Aristolochia* in the State of Para, Brazil. This plant has thriven well in a moist tropical house. It flowered for the first time in February, 1914, when its identity with the Guiana plant described by Masters as *A. longecaudata* was established. Among the especial characters noted by Masters as characteristic of the species is the dense patch of hairs in the perianth throat. Another notable, though in the genus *Aristolochia* rather general feature is the powerful and disagreeable odour of the flowers in

our plant, which it ought to be remarked must not be confused with the very different *A. longecaudata* from Mexico described by Dr. Sereno Watson, which Dr. Rose has more recently renamed *A. Pringlei*. Already two Birthworts with elongated perianth-lobes have been described in this work. One of these was figured at t. 2545 as *A. labiosa*, Ker-Gawl.; this species, which has the lobe widened and 2-lobulate at the end and of a paler ground-colour, was also figured as *A. cymbifera*, Mart. & Zucc., which is the correct name, in the Botanical Register at t. 1543. The other species with an elongated lobe already figured here is *A. grandiflora*, Vahl, described at t. 4369; in this plant the basal portion of the lobe is suborbicular, above the base it is suddenly contracted into a long tail. The species to which *A. longecaudata* is most closely allied is *A. Leprieurii*, Duchartre, which differs in having the inflated portion of the perianth straight.

Description.—*Herb*, perennial. *Stem* scandent, sparingly shortly hirsute. *Leaves* entire or lobed, more or less ovate or oblong, acute or acuminate, base cordate, up to $4\frac{1}{2}$ in. long, $\frac{3}{4}$–$2\frac{1}{4}$ in. wide, glabrous above, minutely and densely pubescent beneath, 3-nerved, the side nerves one-fourth shorter than the leaf-blade, the veins closely reticulated; petiole $1\frac{3}{4}$ in. long, pubescent. *Flowers* solitary, axillary; pedicels $1\frac{1}{4}$ in. long, pubescent. *Perianth* of a pale cream ground colour, with brown streaks and reticulations externally, basal portion obliquely inflated, $1\frac{3}{4}$ in. long, about 1 in. wide, with 2 lateral white-arachnoid patches within; throat densely clothed with brown hairs inside; lobes gradually narrowed to the end from a base $1\frac{1}{4}$ in. wide, about 8 in. long, spirally twisted throughout. *Stamens* 6; anthers waxy-yellow. *Ovary* $1\frac{1}{4}$ in. long, pubescent, slightly sulcate; style-arms 6, obtuse.

Fig. 1, an entire leaf, from lower portion of stem; 2, portion of the underside of a leaf; 3, hairs; 4, one-half of the corolla-tube, laid open; 5, spinose hairs in throat; 6, hairs from nearer the base of the tube; 7, hairs of the base, flat-adpressed; 8, stamens and pistil:—*all enlarged except* 1, *which is of natural size.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp

L. Reeve & Co. London.

Tab. 8614.

HIPPEASTRUM Elwesii.

Argentina.

Amaryllidaceae. Tribe Amarylleae.

Hippeastrum, *Herb.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 724.

Hippeastrum (§ Habranthus) Elwesii, *C. H. Wright in Kew Bulletin*, 1914, p. 330; species *H. Ananucae*, Phil., affinis, perianthii segmentis luteis concoloribus, tubo intus sanguineo, staminibusque perianthio dimidio brevioribus differt.

Herba bulbosa. *Folia* synanthia, linearia, acuminata, concava, 26 cm. longa, 5 mm. lata. *Pedunculus* cylindricus, 6 mm. diametro, biflorus; spathae 2, herbaceae, oblongae, concavae, acutae, 6 cm. longae, 8 mm. latae; pedicelli circiter 4 cm. longi, crassiusculi. *Perianthium* clare luteum, tubo intus sanguineo; tubus infundibuliformis, 1 cm. longus, basi 6 mm. diametro, squamis brevibus transversalibus supra filamentorum insertionem instructus; lobi demum subpatentes, elliptici, subacuti, 4 cm. longi, 1·8 cm. lati. *Stamina* perianthio dimidio breviora. *Ovarium* oblongum, 12 mm. longum, 7 mm. latum, subcylindricum; stylus staminibus duplo longior; stigmatis rami breves.—C. H. Wright.

The *Hippeastrum* of which a plate is given here was discovered by Mr. H. J. Elwes in 1902 near Lake Nahuel-Huapi on the Rio Limay in Argentina. The upper reaches of this river, where *H. Elwesii* grows, are in a high dry valley with a cold winter climate and with a vegetation quite different from that met with at similar altitudes on the Chilian side of the Andes. A plant brought to England by Mr. Elwes flowered in his garden at Colesborne in September, 1903, and the scape then produced forms the main part of the present figure. The plant flowered again in September, 1914, and from material then supplied the plate was completed. In the genus *Hippeastrum*, *H. Elwesii* seems very distinct in the ultimately spreading perianth-lobes. It is perhaps most nearly allied to *H. Ananuca*, Phil., originally described from specimens collected at Caldera in the province of Atacama, but is readily distinguished from that species by its uniformly pale yellow perianth-lobes with the tube claret-coloured inside; in *H. Ananuca* the lobes though yellow elsewhere have vivid red midribs.

The prolonged interval between the first and second flowering of this plant at Colesborne testifies to the difficulty experienced in providing suitable conditions. This difficulty, Mr. Elwes points out, it shares with antipodean bulbs generally, and resides in their unwillingness to change their season of growth. The beautiful terrestrial orchids secured by Mr. Elwes during the journey of 1902 it has been impossible to preserve, and even in those instances in which species like *Tecophilaea cyanocrocus*, *Hippeastrum pratense*, *Alstromeria Hookeri* have survived, it has been necessary to afford frame protection. Even when raised from seed ripened in this country the plants of *Alstromeria* do not readily change their season, but continue in growth throughout the winter. Doubtless it is largely owing to this intractability that comparatively few of the beautiful bulbous plants from the Andes of Chile and Northern Patagonia are to be found in English gardens, and it would be well if those who have correspondents resident there could induce these to send plants or seeds to this country and to repeat their introductions from time to time until the difficulty to which Mr. Elwes refers has been at last overcome.

Description.—*Herb*, bulbous at the base. *Leaves* contemporaneous with the flowers, linear, acuminate, concave, about 10 in. long, $\frac{1}{5}$ in. wide. *Peduncle* cylindric, $\frac{1}{4}$ in. thick, 2-flowered; spathes 2, herbaceous, oblong, concave, acute, $2\frac{1}{4}$ in. long, $\frac{1}{3}$ in. broad; pedicels about $\frac{1}{6}$ in. long, rather stout. *Perianth* pale yellow, tube claret-coloured within; tube funnel-shaped, over $\frac{1}{3}$ in. long, $\frac{1}{4}$ in. wide at the base, with a series of short transverse scales within above the point of attachment of the filaments; lobes at length somewhat spreading, elliptic, subacute, $1\frac{3}{4}$ in. long, $\frac{3}{4}$ in. wide. *Stamens* half the length of the perianth. *Ovary* oblong, $\frac{1}{2}$ in. long, under $\frac{1}{3}$ in. wide, subcylindric; style twice as long as the stamens, stigmatic arms short.

Fig. 1, base of one segment of the perianth, showing transverse scale and stamen; 2, pistil:—*both enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lith.

L. Reeve & Co. London.

Tab. 8615.

PHELIPAEA foliata.

Crimea and Caucasus.

Orobanchaceae.

Phelipaea, *Desf.* (ex parte); *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 982.

Phelipaea foliata, *Lambert in Trans. Linn. Soc.* vol. x. p. 260, t. 7, a caeteris generis speciebus differt corollae lobis minus latis patentibus, haud vel leviter imbricatis, antheris glabris.

Herba parasitica, aphylla, ab 30 cm. alta. *Caulis* simplex, crassiusculus, sparse vel superne densiuscule pube minutissima glandulosa atro-rufa indutus, rubescens. *Squamae* ovato-oblongae, obtusae, semiamplexicaules, longitudine valde variae, secundum caulem ad eius medium dispersae, magis minusve remotae. *Flos* terminalis, solitarius, bracteatus. *Calyx* late campanulatus, inaequaliter 5-lobus, 1·5–3 cm. longus, tubo 5 mm. (raro ultra) longo, ob lobos posticos 3 retrorsum, anticos 2 antrorsum approximatos subbilabiatum, lobis oblongis vel ovatis, obtusis vel acutis, totus magis minusve pube eadem ac caulis indutus. *Corollae* tubus latus, curvatus, 1·5–2·5 cm. longus, supra medium obliquissime ampliatus, extra flavidus, rubro-suffusus et superne tenuiter papillosus, intus antice e fauce ad staminum insertionem ferrugineo-barbatus; limbus coccineus, 2-labiatus, lobis subaequalibus rotundo-ellipticis vel rotundo-oblongis patentibus obtusis fere 1·5 cm. longis, paulo minus latis, labio infero ad fauces maculis binis atris in tubum descendentibus et ibi confluentibus rufo-barbatis ornato. *Filamenta* glabra; antherae mucronatae, 3 mm. longae, glabrae. *Ovarium* glabrum; stigma late discoideum, subintegrum. *Capsula* late ovoidea, ultra 1 cm. longa.—*P. coccinea*, Poir., Encycl. Meth. vol. v. (1804), p. 268 (ex parte ?); Bornmuell. in Bull. Herb. Boiss. sér. 2, vol. ii. (1904), p. 687 (ex parte). *Lathraea Phelypaea*, Gueldenst., Reis. d. Russl. vol. i. (1787), p. 422, non Linn. *Orobanche coccinea*, M. Bieb. Tabl. Prov. entre Terek et Kour (1797), p. 58; Fl. Tour. Cauc. vol. ii. (1808), p. 84 (excl. syn Tournef. et Lamk); Reichenb., Pl. Crit. t. 699, fig. 937, 938. *Anoplon Biebersteinii*, C. A. Mey., Verzeichn. Pfl. Cauc. (1831), p. 104. *A. coccineum*, C. Koch in Linnaea, vol. xxii (1849), p. 670. *Anoplanthus coccineus*, Walp. Repert. vol. iii. (1845), p. 481 (ex parte); Boiss. Fl. Or. vol. iv. (1879), p. 494; Gard. Chron. 1914, vol. iv. p. 401, fig. 184. *Anoplanthus Biebersteinii*, Reut. in DC. Prodr. vol. xi. (1847), p. 42, excl. var. β; Regel in Gartenfl. (1880), p. 34, t. 1000.—O. Stapf.

The genus to which the striking and brilliantly coloured parasite now depicted belongs was discovered by Tournefort in Armenia in 1701, and dedicated by him to the family of the distinguished Chancellor of France, Louis Phelipeaux, Count of Pontchartrain who, as the Secretary of State in charge of the Academies, moved his Sovereign in 1699 to send Tournefort to the Levant.

Unfortunately Tournefort added to his genus a yellow-flowered Iberian species of *Cistanche*. This misapprehension might have been of small account had not Linnaeus, half a century later, placed Tournefort's genus in *Lathraea*, as *L. Phaelypaea*, including in his species so named both the *Phelipaea* and the *Cistanche*, and, to make matters worse, treating the red-flowered *Phelipaea* as a mere variety of the yellow-flowered *Cistanche*. The extraordinary degree of confusion which resulted from this treatment it took nearly a century and a half to clear up; the story has been lucidly told by Dr. Stapf in the Kew Bulletin for 1915. In the meantime it is sufficient to remark that the name *Anoplanthus* which has been used for this genus is a needless innovation and that, so far as is known, there are but three species of *Phelipaea*, the species discovered by Tournefort, which Desfontaines named *P. Tournefortii*; the subject of our plate, which Lambert named *P. foliata*; and a third species, *P. Boissieri*, a description of which is to be found in Dr. Stapf's article in the Kew Bulletin. The original species has been repeatedly collected in Armenia and occurs also in Kurdistan. The one now figured was first met with near Tiflis by Güldenstedt and in the northern foothills of the Caucasus and in Daghestan and Shirwan by Marshal von Bieberstein. It has since been collected in various localities on both sides of the Caucasus and in the southern Crimea. The area of the genus extends to North Syria, through Southern Asia Minor as far as Caria, and eastwards to Tabriz. The host-plant of *P. foliata*, so far as is known, is always *Centaurea dealbata*; *P. Tournefortii* has been collected as a parasite affecting *Pyrethrum myriophyllum*.

The plants on which our figure has been based were grown at Kew from seeds received from the Botanic Garden, Tiflis, in 1911. In this case the host-plant was *Centaurea dealbata*. The seeds of host and parasite were sown together in a pot, but only the *Centaurea* came up. Later in 1911 the *Centaurea* was planted in the Rock Garden, where it grew alone until, in May, 1914, seven stems of the *Phelipaea*, each bearing a solitary flower-bud, made their appearance, the first bud to open doing so in the middle of the month. It is

interesting to recollect that a very similar experience has been recorded in Gartenflora for 1880 on the part of the Imperial Botanic Garden, Petrograd. There, in June, 1879, after a corresponding interval, plants of *P. foliata* made their appearance in association with a *Centaurea*. The difference in this case is that roots, not seeds, of the host, which had come from the Caucasus, were planted in the first instance. The combination of the bright scarlet flowers of the parasite with the silvery grey foliage of the host is singularly attractive, and one marked feature of the partnership in the Kew case has been that the health of the host, so far as may be judged by its appearance, has remained unimpaired.

DESCRIPTION.—*Herb*, parasitic, leafless. *Stems* simple, rather stout, glandular-puberulous especially in the upper half, reddish, 1–1½ ft. high. *Scales* ovate-oblong, obtuse, stem-clasping, scattered on the lower half of the stem and fairly wide apart, papillose-puberulous or glabrous. *Flower* solitary, terminal, ebracteate. *Calyx* campanulate, ⅔–1¼ in. long, unequally 5-lobed, usually somewhat 2-lipped and more deeply divided between the 3 upper approximate lobes and the two lower; lobes oblong or ovate, obtuse, more or less glandular-papillose throughout, or glabrescent upwards, deep-red or chestnut-brown. *Corolla* ringent; tube widely and obliquely campanulate, at length incurved, ⅔–1 in. long, orange flushed with red outside, and sparingly papillose upwards, pilose in the front of the throat down to the attachment of the filaments; limb 2-lipped, lobes of each lip subequal, rounded, those of the upper rather smaller than those of the lower, ⅕–¼ in. across, reddish-yellow outside, brilliant crimson within, the throat with 2 black hirsute spots. *Filaments* glabrous; anthers mucronate, ⅛ in. long, glabrous. *Ovary*, glabrous; stigma wide-discoid, subentire. *Capsule* wide-ovate, nearly ½ in. long.

Fig. 1, portion of interior of corolla-tube, showing the attachment of the stamens; 2 and 3, anthers; 4, pistil; 5, sketch of entire plant with its host:—*all enlarged except* 5, *which is much reduced.*

del. J.N. Fitch lith.

Vincent Brooks Day & Son Lith.

L. Reeve & Co. London

Tab. 8616.

DORSTENIA YAMBUYAENSIS.

Belgian Congo.

URTICACEAE. Tribe MOREAE.

DORSTENIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 366.

Dorstenia yambuyaensis, *De Wild. in Ann. Mus. Congo*, sér. 5, vol. ii. p. 241; vol. iii. p. 66, t. 5, p. 67, fig. 2 et 3; affinis *D. Mannii*, Hook. f., sed receptaculi processubus multo longioribus et pinnatisectis differt.

Herba ad 30–50 cm. alta. *Caulis* erectus, dense subhispido-pubescens. *Folia* alterna; petioli 6–10 mm. longi, subhispidi; laminae 7–16 cm. longae, 4–7 cm. latae, elliptico-lanceolatae, abrupte et obtuse acuminatae, basi cuneatae, margine irregulariter dentatae dentibus 1·5–7 mm. longis obtusis, utrinque glabrae, supra nitidae. *Stipulae* 3–10 mm. longae, filiformes, hispidulae. *Pedunculi* axillares, solitarii, 2·5–4·5 cm. longi, subhispidi. *Receptacula* angulato-orbiculata disco 1·5–2 cm. diametro, anguste alata et processubus 1–11 cm. longis circumdata processubus longioribus basi pinnatisectis, dorso tenuiter subhispida, viridia. *Flores masculi* 2–4-andri. *Flores feminei* inter masculos dispersi; ovarium ovoideum in stylum bifidum attenuatum.—N. E. BROWN.

The interesting *Dorstenia* which we figure here is a native of the Belgian Congo, in some districts of which territory it is plentiful. For its introduction to cultivation we are indebted to the efforts of the Director of the Botanic Garden at Eala in the Equatorial Province, whence living plants appear to have reached the Colonial Garden at Laeken near Brussels about the year 1907. It first became known to English horticulture in October, 1910, when a plant was exhibited at a meeting of the Royal Horticultural Society by Messrs. J. Veitch and Sons on behalf of the Director of the Royal Botanic Garden at Brussels. This plant was thereafter presented to the Royal Gardens at Kew, and forms the subject of our illustration. *D. yambuyaensis* is a plant of erect habit and produces its flowers at the tips of slender axillary peduncles when it is about a foot and a half high. As an addition to our tropical greenhouses this species is remarkable for the much elongated pinnatisect processes of the receptacle, a character which at the same time readily distinguishes it from its congeners.

The plant requires a stove temperature and grows well and flowers freely if given a light rich soil. Propagation is readily effected by means of cuttings of the young shoots inserted during the summer months.

DESCRIPTION.—*Herb*; stems erect, 1–1½ ft. in height, closely and rather hispidly hairy. *Leaves* alternate, elliptic-lanceolate, abruptly and bluntly acuminate, base cuneate, margin irregularly toothed, the teeth obtuse, 3–6 in. long, 1½–3 in. wide, glabrous on both sides, dark green and shining above, paler and dull beneath; petiole ¼–⅓ in. long, rather hispidly hairy; stipules ⅛–⅓ in. long, filiform, slightly hispid. *Peduncles* axillary, solitary, 1–1¾ in. long, rather hispidly hairy. *Receptacles* angularly orbicular, disk ⅖–¾ in. across, narrowly winged and giving off a number of marginal processes varying in length from ⅓ in. to over 4 in., the longer processes pinnatisect near their bases, all green and very sparingly hispidly hairy on the back. *Male flowers* with 2–4 stamens. *Female flowers* interspersed among the males; ovary ovoid, narrowed into a 2-fid sublateral style.

Fig. 1, receptacle, seen in section; 2, a male flower; 3, rudimentary ovary of the same accompanied by two stamens; 4, a single stamen showing the inflexed anther of a young flower; 5, ovary:—*all enlarged.*

M.S.del. J.N.Fitch lith.

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Tab. 8617.

ECHIUM Perezii.

Island of Palma.

Boraginaceae. Tribe Borageineae.

Echium, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 863.

Echium Perezii, *Sprague in Kew Bull.* 1914, pp. 210, 267; affinis *E. Wildpretii*, H. H. W. Pearson, a quo thyrso laxo cymis conspicue pedunculatis, styli ramis longioribus, foliorum lamina usque ad basin decurrente distinguitur.

Herba erecta, circiter 0·6 m. alta (in insulis canariensibus ad 2 m. alta). *Caulis* simplex, basi defoliatus, ceterum dense foliatus. *Folia* inferiora deflexa, anguste lineari-lanceolata, circiter 13 cm. longa, 0·8–1·3 cm. lata, caudato-acuminata, in basin sensim angustata, grosse sericeo-pilosa; nervi laterales utrinsecus circiter 4, satis obliqui, supra inconspicui, leviter impressi, subtus elevati; folia superiora adscendentia. *Thyrsus* terminalis, ovoideus, multiflorus, circiter 25 cm. longus, 13 cm. diametro; cymae scorpioideae, conspicue pedunculatae, circiter 8 cm. longae pedunculis 2–3 cm. longis inclusis; cymae inferiores et intermediae bifurcatae, circiter 25-florae, superiores simplices; pedunculi et rhachis patenter pilosi; bracteae lineari-lanceolatae, 6–8 mm. longae. *Calycis* segmenta erecta, lanceolata, acuta, 6–7 mm. longa, 2–3 mm. lata, extra hirsuta. *Corolla* subrotata, regularis, 8 mm. longa, pallide rosea; lobi patentes vel apicem versus leviter deflexi, late ovati, marginibus deflexis. *Stamina* e plicis elevatis corollae tubi orta, longe exserta, aequaliter divergentia. *Stylus* circiter 2 cm. longus, basi et superne glaber, ceterum pilosus; rami fere 2 mm. longi. *Nuculae* tuberculatae, rostro patulo.—T. A. Sprague.

For the introduction to cultivation of the striking *Echium* which forms the subject of our plate, horticulture is indebted to Dr. G. V. Perez of Tenerife, from whom seeds were received at Kew in 1911. These seeds were sown in heat in the following spring, and two years later the plants raised came into flower in the Temperate House, when they were recognised by Mr. Sprague, who has made an exhaustive study of the genus *Echium*, as belonging to a hitherto uncharacterised species, nearly allied to *E. Wildpretii*, figured at t. 7847 of this work. The illustration here given represents one of these plants. The plant now figured resembles *E. Wildpretii* in its foliage except in that the leaves are decurrent to the base; it further differs by its lax thyrse and in having longer style-arms. The species has been named in honour of the discoverer, who has done so much for the cause of botany in the Canaries, and is himself an ardent student of the genus to which it

belongs. *E. Perezii*, the plant now described, is confined to the Island of Palma, one of the western members of the Canary Group, where it was first met with a few years ago near Punta Llana. Its ally *E. Wildpretii* on the other hand is a native of Tenerife. There is a difference possibly of minor importance in the colour of their corollas, that of *E. Wildpretii* being pale red, whereas that of our plant is pale pink. The most striking difference is in their general habit. This will be best appreciated by an examination of photographs of the two published in the Kew Bulletin for 1914 at pp. 266, 267. The treatment most suitable for both is pot-cultivation in a light loamy compost in a sunny greenhouse. The plants of *E. Perezii* when they came into flower were in eight-inch pots.

DESCRIPTION.—*Herb*, tall and erect. *Stem* in the plant figured about 2 ft. high, in those grown in the Canaries over 6 ft. in height, simple, losing its leaves at the base, elsewhere densely leafy. *Leaves* above the base deflexed, narrowly linear-lanceolate, about 5 in. long, $\frac{1}{3}$–$\frac{1}{2}$ in. wide, caudate-acuminate, gradually narrowed to the base, rather coarsely silky; lateral nerves about 4 on each side, somewhat oblique, hardly visible or slightly sunk above, raised beneath; upper leaves similar but ascending. *Thyrse* terminal, ovoid, many-flowered, about 10 in. long and 5 in. across; cymes scorpioid, very markedly pedunculate, about 3 in. long, including the $\frac{3}{4}$–$1\frac{1}{4}$ in. long peduncles; lower and intermediate cymes 2-furcate, about 25-flowered, upper cymes simple; peduncles and rachis pilose with spreading hairs; bracts linear-lanceolate, $\frac{1}{4}$–$\frac{1}{3}$ in. long. *Calyx* lobed nearly to the middle; segments erect, lanceolate, acute, about $\frac{1}{4}$ in. long, $\frac{1}{12}$–$\frac{1}{8}$ in. wide, hirsute outside. *Corolla* subrotate, regular, $\frac{1}{3}$ in. long, pale pink or rose; lobes spreading or with their tips slightly deflexed, wide ovate with deflexed edges. *Stamens* inserted on raised folds of the corolla-tube, far exserted, uniformly divergent. *Style* about $\frac{3}{4}$ in. long, glabrous at the base and near the top, elsewhere pilose; style-arms about $\frac{1}{12}$ in. long. *Nutlets* tubercled.

Fig. 1, a flower; 2, calyx and style; 3 and 4, anthers; 5, pistil; 6, sketch of an entire plant:—*all enlarged except* 6, *which is much reduced.*

M.S. del. J.N. Fitch lith

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Tab. 8618.

POLYSTACHYA paniculata.

Tropical West Africa.

Orchidaceae. Tribe Vandeae.

Polystachya, *Hook.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 540.

Polystachya paniculata, *Rolfe in Dyer, Fl. Trop. Afr.* vol. vii. p. 113; *Gard. Chron.* 1910, vol. xlviii. p. 462, fig. 202; inter species africanas foliis oblongis et coriaceis, floribus ample paniculatis et labello integro distincta.

Herba epiphytica, 15–30 cm. longa. *Caules* erecti, 8–15 cm. longi, subteretes, 3–4-phylli. *Folia* oblonga, breviter et obtuse biloba, coriacea, 14–17 cm. longa, 2·5–3 cm. lata. *Inflorescentia* terminalis, pedunculata, 15–25 cm. longa, ample paniculata, basi spathis oblongis 2 vel 3 obtecta; bracteae minutae; pedicelli graciles, 2 mm. longi. *Flores* numerosi, parvi. *Sepalum* posticum oblongum, subobtusum, 3–4 mm. longum; sepala lateralia ovata, postico latiora. *Petala* linearia, obtusa, 3–4 mm. longa. *Labellum* integrum, recurvum, oblongum, subobtusum, 3–4 mm. longum, margine undulatum. *Columna* lata, brevis. *Pollinia* 4, ovoidea; stipes oblonga; glandula squamiformis.—*Dendrobium paniculatum*, Swartz in Schrad. Neues Journ. vol. i. p. 97; Pers. Syn. vol. ii. p. 523; Lindl. Gen. & Sp. Orch. p. 92.—R. A. Rolfe.

The interesting orchid which forms the subject of our illustration was originally discovered in Sierra Leone by Afzelius and was described by Swartz from this material as *Dendrobium paniculatum*. Its identity had long been doubtful, but was definitely settled owing to the kindness of Professor Fries of Upsala by whom the type of the species was lent to Sir W. T. Thiselton-Dyer while the *Orchidaceae* of Tropical Africa were being described. When the species was transferred to its true genus, *Polystachya*, in 1897, it was still known only from the Afzelian specimens, but a few years later a good herbarium specimen was transmitted to Kew by Mr. C. B. Ussher, who had met with it again in the Mabira Forest, Chagwe, in the Uganda Protectorate. For its introduction to our collections orchid growers are indebted to the late Sir Trevor Lawrence, who had received plants from West Africa communicated by his son, Captain C. T. Lawrence. It flowered in Sir Trevor's collection at Burford, and was exhibited at a meeting of the Royal

Horticultural Society in August, 1910. Since then it has found its way into various collections and has flowered on several occasions. The plant from which our figure has been made was obtained for Kew in 1910 from Messrs. Charlesworth and Co., Haywards Heath. It grows well and flowers annually at Kew in March in a tropical house under the treatment suitable for most species of *Dendrobium* and *Epidendrum*. The flowers of *P. paniculata* are borne in a dense panicle; the yellow sepals and petals striped with orange-red, and the reddish orange lip, combine in rendering it a striking object.

Description.—*Herb*, epiphytic. *Stems* erect, 3–6 in. long, subterete, 3–4-foliate. *Leaves* oblong, shortly bluntly 2-lobed, coriaceous, 5–7 in. long, 1–1$\frac{1}{4}$ in. wide. *Inflorescence* terminal, pedunculate, 6–10 in. long, copiously panicled, clothed below with 2–3 oblong sheaths; bracts minute; pedicels slender, $\frac{1}{12}$ in. long. *Flowers* numerous, small. *Sepals*: posterior oblong, somewhat obtuse, $\frac{1}{8}$–$\frac{1}{6}$ in. long; lateral ovate, wider than the posterior; all yellow with orange stripes. *Petals* linear, blunt, $\frac{1}{8}$–$\frac{1}{6}$ in. long, yellow with a central orange stripe. *Lip* orange, entire, recurved, oblong, rather blunt, $\frac{1}{8}$–$\frac{1}{6}$ in. long, its margin undulate. *Column* short and broad. *Pollinia* 4, ovoid; stipe oblong; gland scale-like.

Fig. 1, a single flower; 2, petal; 3, lip; 4, column; 5, anther-cap; 6, pollinarium; 7, sketch of an entire plant:—*all enlarged except* 7, *which is much reduced.*

3
2

Tab. 8619.

MECONOPSIS Prattii.

Western China.

Meconopsis, *Vig.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 52; *Prantl & Kündig in Engl. & Prantl, Pflanzenfam.* vol. iii. pars 2, p. 141.

Meconopsis (§ Eumeconopsis) **Prattii**, *Prain in Bot. Mag. sub* t. 8568 [nomen]; *Kew Bull.* 1915, p. 148; species e grege *Aculeatarum* ad *M. sinuatam*, Prain, proxime accedens, a qua tamen foliis subintegris petalisque numerosioribus differt.

Herba monocarpica; caulis simplex scapiformis, 3·5–7·5 dm. altus, aculeatus. *Folia* radicalia rosulata demum evanida; caulina alterna, utrinque aculeis simplicibus stramineis induta, lanceolata, margine subintegra, apice acuta, basi in petiolum latiorem angustata, virida subtus pallidiora; lamina 8–14 cm. longa, 2–2·5 cm. lata; petioli inferiores 4–6 cm. longi, gradatim breviores. *Flores* in cymas elongatas racemiformes dispositi; pedicelli saepissime 1–2 cm., rarissime 3–4 cm. longi, aculeati, saepissime bracteati; bracteae foliis conformes nisi minores sessilesque. *Sepala* 2, oblongo-ovata, 1·5 cm. longa, extra densius aculeata. *Petala* 6–8, clare coerulea nonnunquam purpureo suffusa vel raro pallide purpurea, oblonga, obtusa, 2·25–2·5 cm. longa, 1·75–2 cm. lata. *Stamina* indefinita, pluri-seriata; filamenta glabra, discreta, intense coeruleae; antherae oblongae, albidae. *Ovarium* e carpellis 4 compositum, ovoideum, 5–6 mm. longum; stylus glaber, 4 mm. longus; stigma pallide viride. *Capsula* oblonga, 1·25 cm. longa, in toro explanato parum incrassato insidens.—*M. sinuata*, var. *Prattii*, Prain in Journ. As. Soc. Beng. vol. lxiv. pars 2, p. 314. *M. rudis*, Prain in Ann. Bot. vol. xx. p. 347 partim et quoad spp. Szechuan. tantum; Farrer in Gard. Chron. 1914, vol. lvi. p. 318. *M. Wardii*, Hort.; Ward, Land of the Blue Poppy, pp. 138, 139; Farrer in Gard. Chron. 1915, vol. lvii. p. 110 [nomen]. *M. racemosa*, Fedde in Pflanzenr. IV. 104, p. 258, saltem in parte: vix Maxim.—D. Prain.

Within the genus *Meconopsis*, the *Aculeatae* form a compact group of six species differing from the others in being armed with pungent prickles. Three of the six have already been figured in this work: *M. aculeata*, Royle, at t. 5456; *M. latifolia*, Prain, at first treated as a variety of *M. sinuata*, Prain, but now known to be a distinct species, at t. 8223; and *M. rudis*, Prain, at t. 8568. The species now figured as *M. Prattii* was originally included in *M. sinuata*, but the accession of fuller material having shown that this position for the plant was unsatisfactory, it was transferred to *M. rudis* to which it is more nearly allied. This position in turn has

been found untenable; the species now figured differs from *M. rudis* in its more herbaceous foliage, its shorter flowering pedicels, its white in place of yellow stamens, and its pale green in place of yellow stigma. Its native country includes the Western Chinese provinces of Szechuan and Kansu, where it occurs at elevations of 13–15,000 feet above sea-level. The introduction of *M. Prattii* to European horticulture has been due almost equally to Mr. E. H. Wilson and Mr. F. K. Ward. The material on which our figure is based has been provided by a plant raised at the Royal Botanic Garden, Edinburgh, and grown under the name *M. Wardii*, from seed collected by Mr. Ward, which was kindly communicated for the purpose by Professor Bayley Balfour. The species has proved hardy and thrives well under the conditions suitable for *M. aculeata*, *M. latifolia* and *M. rudis*.

Description.—*Herb*, monocarpic; stem $1\frac{1}{4}$–3 ft. high, simple, scapose, prickly. *Leaves* at the base rosulate, but soon disappearing, those of the stem alternate, armed on both sides with simple pale prickles, lanceolate, margin almost entire, apex acute, narrowed below into a rather wide petiole, pale green above, still paler beneath; leaf-blade 3–$5\frac{1}{2}$ in. long, $\frac{3}{4}$–1 in. wide; lower petioles $1\frac{3}{4}$–$2\frac{1}{2}$ in. long, gradually decreasing upwards. *Flowers* arranged in long raceme-like cymes; pedicels usually $\frac{1}{3}$–$\frac{3}{4}$ in., rarely $1\frac{1}{4}$—$1\frac{3}{4}$ in. long, prickly, usually bracteate; bracts like the leaves, but smaller and sessile. *Sepals* 2, ovate-oblong, $\frac{2}{3}$ in. long, rather densely prickly externally. *Petals* 6–8, bright blue, sometimes flushed with purple and occasionally pale purple throughout, oblong, obtuse, about 1 in. long, $\frac{2}{3}$–$\frac{3}{4}$ in. wide. *Stamens* numerous, several-seriate; filaments glabrous, free, dark-blue; anthers oblong, pale buff or white. *Ovary* made up of 4 carpels, ovoid, $\frac{1}{5}$–$\frac{1}{4}$ in. long; style glabrous, $\frac{1}{6}$ in. long; stigma pale green. *Capsule* oblong, $\frac{1}{2}$ in. long, resting on a flattened enlarged torus.

Fig. 1, sepal; 2 and 3, anthers; 4, pistil:—*all enlarged.*

M.S. del. J.N. Fitch lith

Vincent Brooks, Day & Son Lith.

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Tab. 8820.

RHODODENDRON concinnum.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron concinnum, *Hemsl. in Journ. Linn. Soc.* vol. xxvi. p. 21 (1889); *Hemsl. et E. H. Wilson in Kew Bull.* 1910, p. 115; *Rehder et E. H. Wilson in Sargent, Plant. Wilson.* pars 3, p. 522; species foliis conspicue mucronatis subtus densissime lepidotis, calycis lobis polymorphis distincta.

Frutex; ramuli annotini sicco brunnei, nitidi, glabri, hornotini pallidi, glandulis subglobosis parce induti. *Folia* late lanceolata vel elliptico-lanceolata, basi obtusa vel rotundata, apice conspicue et abrupte mucronata, 3–8 cm. longa, 1·5–3 cm. lata, coriacea, supra glandulis subsparsis nigrescentibus induta, conspicue verrucosa, infra glandulis fulvidis numerosissimis et nigrescentibus paucis densissime induta; costa straminea, supra minute puberula, infra elevata, glandulis exceptis glabra, basi circiter 1·25 mm. lata, ad laminae apicem valde attenuata; nervi laterales utrinsecus circiter 12, supra lati et distincti, intra marginem conjuncti, a costa sub angulo 45° abeuntes, infra vix evidentes; petioli 0·5–1 cm. longi, glandulosi. *Flores* terminales, subumbellati, umbellis plerumque 5-floris; perulae sicco brunneae, ovatae vel oblongo-ovatae, subapiculatae, 3–8 mm. longae, 3–4 mm. latae, ciliolatae, extra parce glanduloso-lepidotae; pedicelli 1·5–2 cm. longi, subgraciles, glandulis sessilibus semi-induti. *Calyx* brevissimus, plerumque undulatus, lepidotus. *Corolla* carminea, late infundibuliformis; tubus 1·5 cm. longus, extra parce lepidotus, intra minute puberulus; lobi 5, ovati vel oblongo-ovati, apice rotundati, usque ad 2 cm. longi et 1·5 cm. lati, glabri. *Stamina* 10, exserta, inaequalia; filamenta ad 2·5 cm. longa, in parte breve inferiore ima basi excepta villosula; antherae ochraceae, 2 mm. longae. *Ovarium* 5-loculare, oblongum, 4 mm. longum, densissime lepidotum, apice et basi brevissime pubescens; stylus longe exsertus, stamina superans, curvatus, 2·5–3 cm. longus, purpureus, glaber, stigmate capitato atropurpureo coronatus. *Fructus* cylindricus, 1·5 cm. longus, 0·5 cm. crassus, lepidotus, stylo persistente coronatus.—*R. yanthinum*, Bur. et Franch. in Journ. de Bot. vol. v. p. 94 (1891); Rehder et E. H. Wilson in Sargent, Plant. Wilson. pars 3, p. 518, partim. *R. Benthamianum*, Hemsl. in Kew Bull. 1907, p. 319, non in Gard. Chron. 1910, vol. xlvii. p. 4. *R. coombense*, Hemsl. in Bot. Mag. t. 8280 (1909).—J. Hutchinson.

Among the many novelties from China which have enriched European gardens during the past decade none have been more striking than the members of the genus Rhododendron. The illustrations of such of these as have been described in this work afford but an imperfect idea of their variety and beauty. As experience of the

Chinese forms under cultivation increases, however, questions of relationship and status have arisen in connection with some of them; and certain plants which when first communicated appeared from the descriptive standpoint to be easy of discrimination have been found in our living collections to display characteristics which tend to cast doubt on earlier conclusions. The species which forms the subject of our plate is one that gives rise to such an inquiry. It is one of a series of forms, undoubtedly very closely allied, which certainly constitute a natural group, fairly readily distinguishable from each other by differences in the size and colour of the flower and by some amount of variation in the development of the calyx, but which, nevertheless, in the opinion of Mr. Hutchinson, who has bestowed on them much critical study, may all be very well referred to a single species. So far as regards the calyx, which in many groups of species in the genus affords a constant and distinctive feature, we find in the group under consideration that it may be almost obsolete, as in the case of the original specimens, collected on Mount Omei in Szechuan by the Rev. Mr. Faber, on which *R. concinnum* was based, and as is again the case in the plant now figured; or it may be well developed with oblong-lanceolate ciliate lobes as in the plant described by Professor Bureau and Mr. Franchet as *R. yanthinum*. Yet except as regards their calyces there is no very tangible feature wherein *R. concinnum* and *R. yanthinum* differ, and having regard to the fact that in the extensive series of specimens, both wild and cultivated, which Mr. Hutchinson has examined, there is a complete gradation between these two extremes, the question as to their possible identity calls for consideration. The fact that sometimes in the same truss may be found a calyx in which all or some of the lobes are well developed, and others in which all the lobes are much reduced or practically obsolete is strongly corroborative of Mr. Hutchinson's view. Among cultivated examples it is found that there is a considerable variation in the size of the corolla in plants of different age or under different treatment, and the same feature in wild specimens may be due also to difference of age or to a dissimilar habitat. Variation in the colour

of the corolla is equally manifest and appears equally explicable. Certain minor differences, such as the presence or absence of a few hairs either on the basal portion of the style or on the apex of the ovary, are found to be as inconstant as the degree of development of the calyx-lobes, and to be uncorrelated with the variation in size and colour of the corolla, and Mr. Hutchinson has felt constrained on this account to include in *R. concinnum*, in addition to *R. yanthinum*, not only the form described by Mr. Hemsley in 1907 as *R. Benthamianum*, but the still more distinct-looking *R. coombense*, figured at t. 8280 of this work. It is to be noted that the form described as *R. Benthamianum* which is here referred to is not the plant so described in 1910. The latter differs from all the forms now included under *R. concinnum* in having a conspicuously spotted corolla and a more prominent areolation of the upper surface of the leaf. It has also to be remarked that while *R. coombense* is not distinguishable from *R. concinnum* here figured by any valid morphological feature, in its typical condition these two forms will probably always be treated as culturally distinct. In any case they constitute the extreme conditions of what is an exceedingly variable group of forms, and whatever their relative status may be, the one now figured is the most richly coloured and the most worthy of cultivation in that group. The plant from which our figure has been prepared was presented to Kew in 1908 by Messrs. J. Veitch and Sons, and was raised by them at Coombe Wood from seed obtained on their behalf by Mr. E. H. Wilson during one of his earlier Chinese journeys. Like all the forms included within it by Mr. Hutchinson, that now figured was collected in the neighbourhood of Ta-tsien-lu, in Western Szechuan. It is perfectly hardy and succeeds well in a light loamy or peaty soil.

Description.—*Shrub* with shining glabrous shoots, the youngest drying brown, the older pale, sparingly clothed with subglobose glands. *Leaves* wide-lanceolate or elliptic-lanceolate, base obtuse or rounded, tip conspicuously abruptly mucronate, $1\frac{1}{4}$–3 in. long, $\frac{2}{3}$–$1\frac{1}{4}$ in. wide, coriaceous, somewhat sparingly beset with blackish glands, and markedly verrucose above, beneath densely

clothed with numerous tawny glands with a few blackish glands intermixed; midrib straw-coloured, finely puberulous above, raised beneath and glandular, but without hairs, gradually tapering from base to apex; lateral nerves about 12 on each side of the midrib which they leave at an angle of 45°, broad and distinct above and looping within the margin, very indistinct beneath; petiole $\frac{1}{5}$–$\frac{1}{3}$ in. long, glandular. *Flowers* terminal, subumbellate; truss usually 5-flowered; bud-scales brown when dry, ovate or oblong-ovate, slightly apiculate, $\frac{1}{8}$–$\frac{1}{3}$ in. long, $\frac{1}{8}$–$\frac{1}{6}$ in. wide, ciliolate, sparingly glandular-lepidote outside; pedicels $\frac{2}{3}$–$\frac{3}{4}$ in. long, rather slender, partially clothed with sessile glands. *Calyx* very short or almost obsolete, usually undulate, lepidote. *Corolla* carmine, wide funnel-shaped; tube $\frac{2}{3}$ in. long, sparingly lepidote outside, finely puberulous within; lobes 5, ovate or oblong-ovate, rounded at the tip, $\frac{3}{4}$ in. long, $\frac{2}{3}$ in. wide, glabrous. *Stamens* 10, exserted, unequal; filaments up to 1 in. long, villous for a short space just above the base; anthers yellowish, $\frac{1}{12}$ in. long. *Ovary* 5-celled, oblong, $\frac{1}{6}$ in. long, densely lepidote, shortly pubescent at base and apex; style far exserted, longer than the stamens, curved, 1–1$\frac{1}{4}$ in. long, purple, glabrous; stigma capitate, dark-purple. *Fruit* cylindric, $\frac{2}{3}$ in. long, $\frac{1}{5}$ in. wide, lepidote, tipped by the persistent style.

Fig. 1, tip of leaf; 2, calyx and pistil; 3, scales from ovary; 4 and 5, tamens; 6, transverse section of ovary:—*all enlarged.*

Tab. 8621.

ALPINIA mutica.

Malaya.

Scitamineae. Tribe Zingiberaceae.

Alpinia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 648; *K. Schum. in Engl. Pflanzenr.—Zingib.* p. 308.

Alpinia mutica. *Roxb. in Asiat. Researches*, vol. xi. p. 354; *Hort. Beng.* p. 2; *Fl. Ind.* ed. 1, vol. i. p. 65; *Rosc. Monandr. Pl.* t. 69; *Horan. Monogr. Scit.* p. 34; *Baker in Hook. f. Fl. Brit. Ind.* vol. vi. p. 254; *K. Schum. in Engl. Pflanzenr.—Zingib.* p. 327, *non Hook. f.*, *nec K. Schum.*; species *A. calcaratae*, Rosc., affinis, labello trilobato ecalcarato differt.

Herba perennis. *Caules* 2 m. alti. *Folia* lineari-lanceolata, acuminata, 30–60 dm. longa, 2·5–6 cm. lata, marginibus ciliatis exceptis glabra; petiolus 2 cm. longus, supra canaliculatus; ligula brevis, erosa; vagina usque ad 22 cm. longa. *Panicula* terminalis, erecta; rhachis pilosa; bracteae oblongae, caducae. *Calyx* albus apice roseo-tincto, spathaceus, breviter 3-lobus, pubescens, 2 cm. longus; tubus viridis, subglobosus, pilosus. *Petala* alba, late oblanceolata, obtusa, 3·5 cm. longa, 1 cm. lata. *Staminodia* lateralia brevissima, apice crenulata. *Labellum* obtuse 3-lobum, 4 cm. longum, 3 cm. latum, concavum, basi pulvinis duobus pubescentibus instructum, flavum, lobus terminalis rubro-venosus, lobi laterales rubro-punctati. *Antherae* loculi oblongi; connectivum haud productum. *Stylus* parte superiore curvatus, apice discoideo ciliatoque.—*Renealmia mutica*, Salisb. in Trans. Hort. Soc. vol. i. p. 280.—C. H. Wright.

The *Alpinia* here figured was first described as *A. mutica* in 1810 by Roxburgh, who had obtained it from Penang, then known as Prince of Wales' Island, and cultivated it in the Hon. East India Company's Botanic Garden at Calcutta, where it flowered during the greater part of the year, though most profusely during the hot weather. Its introduction to European cultivation must have been almost simultaneous with its advent to India, for in 1812 Salisbury mentioned it as having then "flowered for three years successively in the stove of the Comtesse de Vandes at Bayswater." In 1828 Roscoe referred to it as flowering regularly in August in the Liverpool Botanic Garden. At a later date it became rare in British collections, and seems eventually to have disappeared from cultivation, though the name survived and became erroneously associated with more than one

of the congeners of our species. The one to which the name is at present more usually misapplied is that described as *A. mutica* at t. 6908 of this work, which, however, differs from the true *A. mutica* here depicted in having much stouter flower-buds, and in possessing a labellum which is not distinctly 3-lobed. For the detection of the error which has crept into horticultural lists, and for the successful reintroduction of the true plant we are indebted to Mr. H. N. Ridley, by whom, while he was still Director of the Botanic Garden at Singapore, the plant from which our figure has been prepared was transmitted to Kew. Grown in a tropical house under the conditions most suitable for species of *Hedychium* and for other species of *Alpinia*, such as *A. nutans* which was figured at t. 1903 of this work, it has thriven well, flowering for the first time in July, 1914, along with the species which in English collections has for a quarter of a century usurped its name, and enabling the difference between the two plants to be objectively appreciated. What the spurious *A. mutica* figured in our pages in 1889 may be is still a matter of some debate. Mr. Ridley has regarded it as identical with *A. assimilis*, Ridl., a species described by him in 1899, but the late Dr. Schumann has treated it as a form of *A. malaccensis*, Roscoe, a figure of which is to be found in the Botanical Register at t. 328. It may be incidentally mentioned that at one time Dr. Schumann himself applied the name *A. mutica* to yet another species from Borneo, which he subsequently recognised as specifically distinct under the name *A. Korthalsii*, K. Schum. The nearest affinity of the true *A. mutica*, Roxb., is, as Mr. Wright has indicated, with *A. calcarata*, Roscoe. The two species are, however, very readily distinguished by their differently shaped labellum, which in *A. mutica* has two basal hirsute glands instead of the spurs met with in that of *A. calcarata*.

Description.—*Herb*, perennial, stems 6–8 ft. high. *Leaves* linear-lanceolate, acuminate, 1–2 ft. long, 1–2½ in. wide, glabrous save for the ciliate edges; petiole ¾ in. long, channelled above; ligule short, erose; sheath reaching 9 in. in length. *Panicle* terminal, erect; rachis pilose; bracts oblong, caducous. *Calyx* white with a

rosy-pink tip, spathaceous, shortly 3-lobed, pubescent, $\frac{3}{4}$ lin. long; tube green, subglobose, hairy. *Petals* white, wide-oblanceolate, obtuse, $1\frac{1}{2}$ in. long, over $\frac{1}{3}$ in. wide. *Staminodes* 2, lateral, very short, crenulate. *Lip* bluntly 3-lobed, over $1\frac{1}{2}$ in. long, $1\frac{1}{4}$ in. across, concave, with basal hirsute glands, yellow with the terminal lobe marked with bright red lines, and the lateral dotted with small red spots. *Anther-lobes* oblong; connective not produced. *Style* incurved towards the top, with a discoid ciliate stigma.

Fig. 1, petiole and ligule with base of leaf-blade and apex of leaf-sheath; 2, portion of edge of leaf, showing the ciliate margin; 3, bracts and buds; 4, calyx, laid open, showing staminodes and pistil; 5, anther; 6, stigma:—*all enlarged except* 4, *which is of natural size.*

M. S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lith.

L. Reeve & Co. London

Tab. 8622.

RHODODENDRON Souliei.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron Souliei, *Franch. in Journ. de Bot.* vol. ix. p. 393 (1895); *Gard. Chron.* 1909, vol. xlv. p. 380, fig. 167; *Hemsl. et E. H. Wils. in Kew Bull.* 1910, p. 108; *Diels in Notes Bot. Gard. Edinb.* vol. v. p. 217 (1911); *Rehder et E. H. Wils. in Sargent, Plant. Wilson.* vol. i. p. 537 (1913); species foliis eglandulosis glabris basi rotundatis vel truncatis, calycis lobis oblongo-ellipticis obtusis glanduloso-ciliatis, corollis late et aperte campanulato-patelliformibus facile distinguenda.

Frutex; rami robusti, glabri; ramuli juniores teretes, purpureo-carminei, glandulis stipitatis rubris instructi. *Folia* sparsa, longe petiolata, oblonga vel oblongo-elliptica, utrinque rotundata vel basi truncata, apice conspicue mucronata, 4–7 cm. longa, 2–4 cm. lata, integra, coriacea, supra atro-viridia, infra pallide viridia vel nonnunquam glauca, tenuiter reticulata, glabra, eglandulosa; nervi laterales utrinsecus 5–8, supra immersi, infra distincti, copiose ramosi; petiolus 2–2·5 cm. longus, circiter 3 mm. crassus, basin versus purpurascens, glaber. *Flores* terminales, circiter 8-nati, laxe dispositi, alabastro roseo-rubri, demum roseo-albi. *Perulae* lineari-filiformes, circiter 7 mm. longae, glanduloso-puberulae; pedicelli 4–5 cm. longi, 2–5 mm. crassi, teretes, purpurei et virides, parce et minute glandulosi. *Calycis* lobi 5, inaequales, uno anteriore late ovato 4–5 mm. longo et lato, ceteris oblongo-ellipticis apice rotundatis vel truncatis 3–5 mm. longis 2–3 mm. latis extra rubro-glandulosis margine glanduloso-ciliatis. *Corolla* campanulato-patelliformis, 5–6-loba; tubus 2 cm. longus, striatus, utrinque glaber; lobi rotundati, emarginati, 2 cm. lati. *Stamina* plerumque 11, exserta; filamenta glabra vel brevissime puberula; antherae brunneae, 2·5 mm. longae. *Discus* lobatus, viridis, glaber. *Ovarium* 5–7-loculare, oblongo-ovoideum, 5 mm. longum, basi 4 mm. diametro, glandulis stipitatis rubris pulcherrimis indutum; loculi in locellos 2 placentis divisi; stylus staminibus paulum longior, crassus, glandulis rubris breviter stipitatis instructus.—J. Hutchinson.

The beautiful Rhododendron now figured is a native of the neighbourhood of Ta-chien-lu in Western Szechuan, where it occurs rather abundantly in upland thickets and woods at about 12,000 feet above sea-level. The plant from which the material for our plate has been derived was raised from seed collected in 1908 by Mr. E. H. Wilson when travelling in China on behalf of Professor Sargent, Arnold Arboretum, by whom a supply was presented to Kew in 1909. There was, however, a previous introduction of this species, also by means of seed obtained by Mr. Wilson, but on behalf of Messrs. J. Veitch and Sons. The species has reached the stage of

flowering after an unusually brief period, for some of the plants raised in 1909 produced blossoms in 1913. Certainly one of the most distinct of the new Chinese Rhododendrons, *R. Souliei* falls within that group of the section *Eurhododendron* in which the leaves are glabrous and have no glands. Within this group it may be at once recognised by its long-petioled wide-based leaves, its well-defined calyx-lobes edged with red glands, and its flat saucer-shaped flowers. At Kew it has thriven well in a semi-shaded position and is of low, bushy habit.

DESCRIPTION.—*Shrub*; branches stout, glabrous; young twigs terete, purplish-pink, beset with red-stalked glands. *Leaves* scattered, long-petioled, oblong or oblong-elliptic, apex rounded and mucronate, base rounded or cordate, $1\frac{1}{2}$–3 in. long, $\frac{3}{4}$–$1\frac{1}{2}$ in. wide, entire, coriaceous, dark green above, pale green or sometimes glaucous beneath, finely reticulate, glabrous, glandular; lateral nerves 5–8 along each side of the midrib, sunk above, visible beneath, much branched; petiole $\frac{3}{4}$–1 in. long, about $\frac{1}{8}$ in. thick, purplish near the base, glabrous. *Flowers* in terminal, loose clusters, each about 8-flowered; rosy-red in bud, white with a rosy flush when fully open. *Bud-scales* narrow-linear, over $\frac{1}{4}$ in. long, glandular-puberulous; pedicels $1\frac{1}{2}$–2 in. long, $\frac{1}{10}$ in. thick, terete, purple and green, sparingly finely glandular. *Calyx* 5-lobed; lobes unequal, the anterior wide-ovate, $\frac{1}{6}$–$\frac{1}{5}$ in. long and broad, the others oblong-elliptic, with rounded or truncate tips, $\frac{1}{8}$–$\frac{1}{5}$ in. long, $\frac{1}{12}$–$\frac{1}{8}$ in. wide, red-glandular outside, and with a glandular-ciliate margin. *Corolla* flat-campanulate, 5–6-lobed; tube $\frac{3}{4}$ in. long, striate, glabrous on both sides; lobes rounded, emarginate, $\frac{3}{4}$ in. across. *Stamens* usually 11, exserted; filaments glabrous or very finely puberulous; anthers brown, $\frac{1}{10}$ in. long. *Disk* lobate, green, glabrous. *Ovary* 5–7-celled, oblong-ovoid, $\frac{1}{5}$ in. long, $\frac{1}{6}$ in. wide at the base, clothed with bright-red stalked glands; each cell divided by the placentas into two chambers; style rather longer than the stamens, stout, beset with short-stalked red glands.

Fig. 1, part of leaf showing venation; 2, calyx and pistil; 3 and 4, stamens; 5, ovary; 6, transverse section of the same:—*all enlarged.*

2
1
3

Tab. 8623.

CORYLUS MANDSHURICA.

Eastern Asia.

Cupuliferae. Tribe Coryleae.

Corylus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 406.

Corylus mandshurica, *Maxim. in Bull. Phys.-Math. Acad. Pétersb.* vol. xv. (1856), p. 137; *Ruprecht, Dec. Plant. Amur.* t. 10; *Herder in Act. Hort. Petrop.* vol. xi. p. 363; *Burkill in Journ. Linn. Soc.* vol. xxvi. p. 505; *Komorov in Act. Hort. Petrop.* vol. xxii. p. 63 (C. manshurica); *C. K. Schneider, Handb. der Laubholzk.* vol. i. p. 150, fig. 83 l–m et fig. 87 d–f (C. mandschurica); *Nakai in Journ. Coll. Sci. Tokyo*, vol. xxxi. p. 206; *Bean, Trees and Shrubs*, vol. i. p. 402; species *C. rostratae*, Ait., valde affinis, sed novellis majus pilosis, foliis latioribus subtus majus pilosis foliis latioribus subtus majus pilosis supra mediam saepe inciso-lobatis, petiolis saepius longioribus differt.

Frutex usque ad 4·5 m. altus ramulis junioribus puberulis vel sparsim pilosis vel hirsutis demum glabrescentibus. *Folia* suborbicularia, elliptica vel ovata, 6–15 cm. longa, saepius 8–10 cm. lata, irregulariter duplicato-serrata, apice acuminata vel subtruncata, supra mediam saepe plus minusve profunde inciso-lobata, basi leviter cordata, utrinque parce vel subtus praecipue ad nervos sat dense molliter pubescentia; petiolus 1–3 cm. (saepius 1·5 cm.) longus. *Stipulae* ellipticae vel ovatae, acutae vel acuminatae, 7–8 mm. longae, 3–5 mm. latae, integerrimae vel interdum paucidentatae. *Amenta* mascula solitaria, bini vel terni; squamae deltoideae, cuspidatae, hirsutae. *Fructus* 2–6 aggregati, saepe rudimentis fructuum immixti. *Involucrum* nucem arcte involvens, superne in tubum productum, parte inferiore praecipue pilis setoso-hispidis flavo-brunneis dense vestitum; tubus 2·5–3·5 cm. longus, cylindricus vel basi paulum ampliatus, leviter pluri-striatus, apice obliquus, plus minusve laciniatus. *Nux* (immatura) depresso-subglobosa, circiter 1 cm. longa et 1·2 cm. lata, breviter mucronata, minute puberula.—*C. rostrata*, Ait., var. *mandshurica*, Regel in Bull. Phys.-Math. Acad. Pétersb. vol. xv. p. 221 *et* Fl. Ussur. p. 141; DC. Prodr. vol. xvi. pars 2, p. 133; Hance in Journ. Linn. Soc. vol. xiii. p. 87; Maxim. in Mél. Biol. vol. xi. p. 319; Palibin in Act. Hort. Petrop. vol. xiv. p. 139; Winkler in Engl. Pflanzenr.—Betulaceae, p. 52.—S. A. Skan.

The Manchurian Hazel belongs to a group in which the involucre is prolonged beyond the nut into a tube sometimes measuring $1\frac{1}{2}$ in. long, and is covered, particularly in the lower part, with yellowish bristly hairs. Its affinities with the Eastern North American *C. rostrata*, Ait., are so evident that it is not always easy to distinguish it. In *C. mandshurica*, however, the leaves are usually broader and are often more or less deeply lobed

in the upper part, though in the specimens from the Kew plant the lobing is not pronounced; the young shoots are generally furnished with a more abundant soft pubescence, and the petioles as a rule are longer. *C. rostrata*, var. *californica*, A.DC. (*C. californica*, Rose), closely resembles *C. mandshurica* in its leaves which are, however, less markedly lobed ; moreover, it has glandular-hispid young shoots, a shorter involucre and a thicker nut-shell. *C. mandshurica*, var. *Fargesii*, Burkill, from Szechuan, differs from the type in having narrowly ovate leaves apparently not cordate at the base. *C. Sieboldiana*, Blume (*C. rostrata*, var. *Sieboldiana*, Maxim.), a Japanese plant, has a much shorter tube to the involucre and differs also in leaf characters.

C. mandshurica is common in mountainous districts in Eastern Manchuria, and forms dense thickets in shady and dry woods. It was first collected by Maximowicz near to the Amur River in 1855. It is also recorded from Corea, from the provinces of Shingking and Chihli in Northern China, and from Yesso and Nippon in Japan. Its introduction to Kew dates from 1882 when nuts were received from the late Dr. E. Bretschneider ; ten years later the plant was received from Prof. Sargent of the Arnold Arboretum, and again in 1906. The material for the figure was furnished by one of the plants raised at Kew from the seed received from Dr. Bretschneider. It is a bush about five feet high and is certainly very hardy. Though it has occasionally produced nuts it did not bear its remarkable fruits in great quantity until 1912. That year, owing, it is assumed, to the great heat of the summer of 1911, and the consequent thorough ripening of the wood, it bore an abundant crop. It thrives in loamy soil and can be increased by layers.

Description.—*Shrub*, attaining a height of 15 ft. in the wild state, young twigs puberulous or sparingly hairy, at length becoming glabrous. *Leaves* suborbicular, elliptic or ovate, $2\frac{1}{2}$–6 in. long, usually 3–4 in. wide, irregularly double-serrate, apex acuminate to almost truncate, often more or less deeply incised-lobed beyond the middle, base slightly cordate, sparingly pubescent above, sometimes rather densely softly pubescent, especi-

ally on the nerves, beneath; petiole $\frac{1}{3}$–$1\frac{1}{4}$ in., but usually about $\frac{2}{3}$ in. long; stipules elliptic or ovate, acute or acuminate, under $\frac{1}{3}$ in. long, about $\frac{1}{6}$ in. wide, entire or occasionally with a few teeth. *Male catkins* solitary or in twos or threes; scales deltoid, cuspidate, hirsute. *Fruits* in clusters of 2–6, often accompanied by abortive ones. *Involucre* closely enveloping the nut, produced upwards in a tube, densely clothed, especially in the lower half, with setose-hispid yellowish-brown hairs; tube 1–$1\frac{1}{3}$ in. long, cylindric or somewhat widened at the base, slightly many-striate; mouth oblique, more or less laciniate. *Nut* (hardly mature) depressed-globose, about $\frac{1}{3}$ in. long and $\frac{1}{2}$ in. wide, shortly mucronate, very finely puberulous.

Fig. 1, part of male catkin; 2, male flower; 3, female flower; 4, section of the base of the involucre, showing nut:—*all enlarged.*

M. S. del. J. N. Filch lith.

Vincent Brooks, Day & Son Lith. Imp.

L. Reeve & Co. London.

Tab. 8624.

SENECIO glastifolius.

South Africa.

Compositae. Tribe Senecionideae.

Senecio, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 446.

Senecio glastifolius, *Linn. f. Suppl.* 372 (1781); *Thunb. Fl. Cap. ed. Schult.* p. 681; *DC. Prodr.* vol. vi. p. 408; *Harv. in Harv. et Sond. Fl. Cap.* vol. iii. p. 390; *Gard. Chron.* 1910, vol. xlviii. p. 43 cum icon.; affinis *S. multibracteato*, Harv., sed foliis non scabridis pedunculis parce bracteolatis differt.

Herba gracilis, alta; caulis superne ramosus, sulcatus, viridis, glaber. *Folia* linearia, apice subacuta, basi leviter decurrentia, usque ad 8 cm. longa, 0·5–1 cm. lata, remote denticulata, tenuiter chartacea, glabra vel subtus minutissime puberula, utrinque viridia. *Capitula* pauca, laxe corymbosa, 5·5–6 cm. diametro; pedunculi graciles, parce bracteati, usque ad 10 cm. longi. *Involucrum* campanulatum, circiter 1 cm. longum; bracteae subtriseriatae, exterioribus ceteris circiter dimidio brevioribus, lineares, apice nigrae, subacutae, glabrae, marginibus anguste membranaceis. *Flores radii* plerumque 13, roseo-lilacini; corollae tubus gracilis, 5 mm. longus, glaber, lamina lineari-oblonga, apice tridentata, 2–2·5 cm. longa, 5–7 mm. lata, nervosa. *Flores disci* lutescentes; corollae tubus superne leviter ampliatus, 7 mm. longus, glaber; antherae leviter exsertae; achaenia oblonga, 1·5 mm. longa, minutissime puberula; pappi setae sericeae, corollis aequales, albae.—J. Hutchinson.

The *Senecio* which forms the subject of our illustration is a native of South Africa, where it is known to occur throughout the coast region from the district of Riversdale as far as Algoa Bay. There are one or two earlier but doubtful records which connect the species with the Table Mountain region, but there is no definite proof of its presence there now. The late Dr. Harvey included *S. glastifolius* in the group of species of a shrubby or almost shrubby character which he designated the *Rigidi*. At the same time there is no doubt that it is extremely closely allied to another species from the same general region, *S. multibracteatus*, Harv., which has been referred by its author to the group *Annui* recognised by him. From *S. glastifolius* it is very easy to distinguish *S. multibracteatus* owing to the scabrid leaves and more

copiously bracteate peduncles of the latter plant. Herbarium material of *S. glastifolius* shows that there is considerable variation in the shape, texture and toothing of the leaves. These changes of appearance, which may be due to the conditions under which the plants have grown, leave the flower-heads remarkably uniform and unmistakable on account of the numerous exterior supplementary bracts. From a remark in the note which accompanies a full-page illustration of the species in the Gardeners' Chronicle for 1910, it would appear that *S. glastifolius* was raised by Messrs. Sutton and Sons from seeds received by them from the district of George, immediately to the east of Riversdale. The plant from which the figure here given has been prepared was presented to Kew in 1913 by Mr. H. Rabjohn, Twickel, Delden, Holland, and flowered in a greenhouse in April, 1914. It is a perennial, is easily propagated by cuttings and grows into an elegant upright plant, about four feet in height, flowering during April and May. It does well if given conservatory treatment and grown along with greenhouse Cinerarias, but it may be noted that Mr. Rabjohn, in the Gardeners' Chronicle, writing from Welbeck Abbey, Worksop, in 1910, has described it as being vigorous in an open border, resisting successfully ten degrees of frost, though succumbing when the thermometer fell to 15°.

Description.—*Herb*, perennial, slender, erect, 4 ft. high; stem branching upwards, sulcate, green, glabrous. *Leaves* linear, subacute, slightly decurrent at the base, up to 3 in. long, $\frac{1}{5}$–$\frac{1}{3}$ in. wide, distantly toothed, thinly papery, glabrous on both sides or faintly puberulous beneath, green. *Flower-heads* few, loosely corymbose, $2\frac{1}{4}$–$2\frac{1}{2}$ in. across; peduncles slender, sparingly bracteate, up to 4 in. long. *Involucre* campanulate, over $\frac{1}{3}$ in. long, bracts subtriseriate, the outer about one half the length of the others, linear, dark-tipped, subacute, glabrous with narrow membranous margins. *Ray-florets* usually 13, rose-lilac; corolla-tube slender, $\frac{1}{5}$ in. long, glabrous; ligule linear-oblong, 3-toothed at the tip, $\frac{1}{4}$–1 in. long, about $\frac{1}{4}$ in. wide, distinctly nerved. *Disk-florets* yellowish; corolla-tube slightly widened upwards, over

$\frac{1}{4}$ in. long, glabrous; anthers slightly exserted; achenes oblong, over $\frac{1}{2}$ in. long, finely puberulous; pappus-setae silky, as long as the corolla, white.

Fig. 1, portion of a leaf; 2, bract of the involucre; 3, ray-floret; 4, disk-floret; 5, the same, further magnified; 6, setae of the pappus; 7, anthers; 8, style-arms:—*all enlarged.*

Tab. 8625.

POPULUS lasiocarpa.

China.

Salicaceae.

Populus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 412.

Populus lasiocarpa, *Oliver in Hook. Ic. Plant.* t. 1943; *Burkill in Journ. Linn. Soc.* vol. xxvi. p. 536; *J. H. Veitch in Journ. R. Hort. Soc.* vol. xxviii. p. 65, fig. 27; *C. K. Schneider, Handb. d. Laubholzk.* vol. i. p. 17; *Dode in Mém. Soc. Hist. Nat. Autun*, vol. xviii. p. 66; *Gambocz in Math. Termes Közl.* vol. xxx. p. 120; *Mottet in Rev. Hort.* 1911, p. 565, fig. 219; *Henry in Elwes & Henry, Trees of Gt. Brit. & Irel.* vol. vii. p. 1846, t. 408, fig. 9; *Bean, Trees and Shrubs*, vol. ii. p. 215; species *P. glaucae*, Haines, valde affinis, sed foliis basi profunde cordatis, capsulis ovoideis facile distinguenda.

Arbor 12–18 m. alta, ramulis junioribus angulatis crassis plus minusve pubescentibus; gemmae magnae, viscidae. *Folia* ovata, acuta vel breviter acuminata, regulariter glanduloso-crenato-serrata, basi profunde cordata sinu angusto, 15–25 cm. longa, 10–20 cm. lata, rubro-nervosa, supra basin biglandulosa, primo utrinque plus minusve tomentosa, deinde supra glabrata, subtus praesertim ad nervos primarios tomentosa; petiolus teretiusculus, 5–10 cm. longus, cito glabratus, ruber; stipulae oblongo-lanceolatae, caducae. *Amenta* 10–15 cm. fructifera usque ad 20 cm. longa, saltem in specimine culto floribus breviter pedicellatis polygamis praedita; rhachis crassiuscula, tomentosa, parce pilosa vel glabrata; bracteae scariosae, ovatae vel obovatae, basin versus angustatae, superne tenuiter laciniatae, 10–12 mm. longae. *Discus* florum subpatelliformis, 5–7 mm. diametro, breviter et inaequaliter 6–10-lobatus, saepe glaberrimus. *Stamina* in floribus masculis ad 23 vel plura, in floribus bisexualibus pauciora, interdum tantum 3–6; antherae oblongae, 2·5 mm. longae, apiculatae. *Ovarium* ovoideo-globosum, lanuginosum, disco longior. *Styli* rami 2–4, apice late plurilobati. *Capsula* ovoidea, dense lanuginosa, 8–12 mm. longa, 2–4-valvata.—*P. Fargesii*, Franch. in Bull. Mus. Hist. Nat. Paris, vol. ii. p. 280.—S. A. Skan.

This remarkable Poplar is one of the many plants first collected in China by Mr. A. Henry, who found it in the districts of Chienshih and Patung, Hupeh, in 1888, and noted that it was common on the mountains at 4000 to 6000 feet. It was afterwards collected at Tchenkeoutin in Szechuan by Farges, and in 1900 it was introduced into cultivation by Messrs. Veitch and Sons through Mr. E. H. Wilson, who being unable to introduce the tree by means of seeds, sent home a living plant. It is from this individual, which grew in the Coombe Wood nursery

until the sale of the collections there, that the specimens in collections in this country have been propagated. As regards size of leaf *Populus lasiocarpa* is undoubtedly the finest of all the poplars of which we have knowledge. Even a double plate of this work is insufficient to show the dimensions of its leaves in full; the blade not infrequently measures fourteen inches in length by nine inches in width and, whatever the measurement, is conspicuous for the rich red of the midrib and chief veins and petiole. In vegetative characters our tree resembles *P. heterophylla*, Linn., of the Eastern and South-eastern United States; its catkins, however, are very different, and its closest ally is doubtless *P. glauca*, Haines, from Tonglo in Sikkim; like this latter species it has polygamous flowers. The few flowering catkins seen were obtained from a cultivated plant, and may not be characteristic of the species. It should be mentioned, however, that *P. glauca*, so far as Mr. Haines has observed, produces in the wild state female or more frequently only hermaphrodite flowers; he found no male tree. The male catkins accompanying Henry's specimens were picked up from the ground beneath a leafless tree in South Patung, and Prof. Oliver cautiously dealt with them as possibly not belonging to *P. lasiocarpa*. The flowers have much longer pedicels than those of the cultivated plant, and the disk is distinctly oblique. The anthers agree. *Populus lasiocarpa* flowered in 1914 in the gardens of Mr. F. C. Stern, Highdown, Goring-by-Sea, Sussex, and of Sir Harry Veitch, East Burnham Park, Slough, and the figure was prepared from material received from the former supplemented by catkins of more mature fruits from Sir Harry Veitch. The species thrives well on deep loam, and, like most poplars, enjoys abundant moisture at the root. Hitherto it has been propagated by grafting on stocks of the Black Poplar group, but it will eventually, no doubt, be found to succeed better on its own roots.

Description.—*Tree*, 40–60 ft. high; young shoots angular, stout, more or less pubescent; buds large, viscid. *Leaves* ovate, acute or shortly acuminate, regularly glandular-crenate-serrate, base deep cordate with

contracted sinus, 6–10 in. long, 4–8 in. across, red-veined, biglandular above the base, at first more or less tomentose on both surfaces, at length becoming glabrous above, but remaining tomentose beneath, especially along the principal nerves; petiole subcylindric, 2–4 in. long, soon becoming glabrous, red; stipules oblong-lanceolate, caducous. *Catkins* 4–6 in., in fruit up to 8 in. long, in our cultivated specimens bearing short-pedicelled polygamous flowers; rachis rather stout, tomentose, sparingly pilose or becoming glabrous; bracts scarious, ovate or obovate, narrowed towards the base, finely laciniate upwards, $\frac{1}{3}$–$\frac{1}{2}$ in. long. *Disk* of the florets somewhat patelliform, about $\frac{1}{4}$ in. across, shortly and unequally 6–10-lobed, usually quite glabrous. *Stamens* in the male florets 23 or more, in the bisexual florets fewer and at times only 3–6; anthers oblong, $\frac{1}{10}$ in. long, apiculate. *Ovary* ovoid-globose, woolly, longer than the disk. *Style-arms* 2–4, broadly many-lobed at their tips. *Capsule* ovoid, densely woolly, $\frac{1}{3}$–$\frac{1}{2}$ in. long, 2–4-valved.

Fig. 1, base of a leaf, showing the glands; 2, bract; 3, male flower; 4 and 5, stamens; 6, hermaphrodite and female flowers; 7, a female flower, laid open:—*all enlarged.*

M. S. del. J.N. Fitch lith.

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Tab. 8626.

GLADIOLUS Melleri.

Tropical Africa.

Iridaceae. Tribe Ixieae.

Gladiolus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 709.

Gladiolus Melleri, *Baker in Journ. Bot.* 1876, p. 334; *Rolfe in Oates, Matabele Land*, ed. 2, p. 409; *Baker, Handb. Irid.* p. 212, et *in Dyer, Fl. Trop. Afr.* vol. vii. p. 362; *Rendle in Trans. Linn. Soc.* ser. 2, Bot. vol. iv. p. 49; species *G. Buchanani*, Baker, affinis; foliis rigidioribus staminibusque quam perianthii segmenta superiora distincte brevioribus differt.

Herba. Cormus depresso-globosus, 2 cm. diametro. *Folia* pauca, linearia, acuta, rigida, valde costata, 30 cm. longa, 1·4 cm. lata, glabra. *Scapus* 65 cm. altus, gracilis, rigidus; flores inter se 3 cm. distantes; spathae valvae oblongo-lanceolatae, acuminatae, rubro-tinctae, exterior 4 cm. longa, 7 mm. lata, interior 1·5 cm. longa. *Perianthium* rubrum; tubus 2 cm. longus, anguste infundibuliformis, leviter curvatus; limbus obliquus, tubo longior; segmenta oblongo-cuneata, obtusa vel subacuta, superiora 4 cm. longa, 1·2 cm. lata, inferiora 2·5 cm. longa, 1 cm. lata. *Stamina* quam perianthium dimidio breviora; antherae oblongae, luteae. *Stylus* staminibus longior, ramis papillosis, 7 mm. longis. *Capsula* oblonga, obtusa, 2 cm. longa, 8 mm. diametro. *Semina* obovata, compressa, 8 mm. longa, 5 mm. lata, ala membranacea circumdata.—C. H. Wright.

The *Gladiolus* here depicted was discovered by Mr. C. J. Meller in 1861 on the Manganja Hills, Nyasaland, during the Zambesi Expedition led by Dr. Livingstone. Since then *G. Melleri* has been found to occupy a considerable area in Eastern Tropical Africa, for it has been collected at various localities in British Central Africa, in Portuguese East Africa, in the Matabele country and in Mashonaland. The plant which has formed the subject of our plate flowered at Kew in October, 1913, the corm having been received in June from Mr. A. Hislop who had obtained it at Makoni Kop, Rusape, Rhodesia. The nearest ally of *G. Melleri* is *G. Buchanani*, Baker, another Nyasaland species, in which, however, we find several well-developed leaves about as long as and produced along with the inflorescence, instead of only one rigid far-produced leaf with several much shorter sheathing leaves as in our plant. Grown in a greenhouse with other

species of *Gladiolus*, *G. Melleri* thrives well, and in facies affords an interesting contrast with most of them.

DESCRIPTION.—*Herb*, erect, slender, rather stiff; corm depressed-globose, $\frac{3}{4}$ in. across. *Leaves* few, linear, acute, rigid, strongly ribbed, about a foot long, over $\frac{1}{2}$ in. wide, glabrous. *Scape* about 2 ft. high, slender, stiff; flowers about $1\frac{1}{4}$ in. apart; valves of the spathe oblong-lanceolate, acuminate, flushed with red, outer $1\frac{1}{2}$ in. long, over $\frac{1}{4}$ in. wide, inner about $\frac{2}{3}$ in. long. *Perianth* red; tube $\frac{3}{4}$ in. long, narrow funnel-shaped, slightly curved; limb oblique, longer than the tube, segments oblong-cuneate, obtuse or subacute, upper $1\frac{1}{2}$ in. long, $\frac{1}{2}$ in. wide, lower 1 in. long, over $\frac{1}{3}$ in. wide. *Stamens* half the length of the perianth; anthers oblong, yellow. *Style* longer than the stamens; stigmatic arms papillose, over $\frac{1}{4}$ in. long. *Capsule* oblong, obtuse, $\frac{3}{4}$ in. long, $\frac{1}{3}$ in. wide. *Seeds* obovate, compressed, $\frac{1}{3}$ in. long, $\frac{1}{5}$ in. wide, with a membranous wing.

Figs. 1 and 2, anthers; 3, style-arms:—*all enlarged.*

Tab. 8627.

ORNITHOBOEA Lacei.

Burma.

Gesneriaceae. Tribe Cyrtandreae.

Ornithoboea, *Parish ex C. B. Clarke in DC. Monogr. Phan.* vol. v. p. 147.

Ornithoboea Lacei, *Craib in Kew Bull.* 1913, p. 115; ab affini *O. Parishii*, C. B. Clarke, foliorum nervis prominentibus floribus majoribus labii inferioris lobis emarginatis distinguenda.

Herba, forsan biennis; caulis pars basalis annotina ad 11 cm. longa, 5–6 mm. diametro, plus minusve quadrangularis, basibus petiolorum persistentibus dense tecta, apicem versus praecipue densius pilosa; pars hornotina florifera saepius circiter 30 cm. alta, undique glanduloso-pilosula. *Folia* valde inaequilateralia, plerumque late ovata, apice acuminata, acutiuscula vel obtusa, basi rotundata, latere uno altero usque ad 7 mm. altius terminata, 3·5–11 cm. longa, 2·5–8·5 cm. lata, chartacea, pagina utraque pilosula et inferiore pallidiore minute aureo-glandulosa, nervis lateralibus utrinsecus ad 10 supra conspicuis subtus cum nervis transversis prominentibus, crenato-serrata, petiolo usque ad 12 cm. longo glanduloso-pilosulo suffulta. *Cymae* axillares, petiolis dimidio breviores; pedicelli saepius 1·5 cm. longi, glanduloso-pilosuli. *Sepala* inter se subaequalia, oblongo-lanceolata, apice acuminata, acuta, ad 7 mm. longa, 3·5 mm. lata, utrinque pilosula. *Corollae* tubus 7 mm. longus; labium inferius tubo aequilongum, e lobis tribus oblongis apice emarginatis inter se paulo inaequalibus viz 5 mm. longis ad 3·5 mm. latis constitutum; labium superius lobis duobus brevibus alte bifidis. *Stamina* 2, antheris majusculis; staminodia 3, superiore minuto. *Ovarium* 2 mm. altum, dense glandulosum; stylus 5 mm. longus. *Fructus* ad 1·5 cm. longus, 2·5 mm. diametro, glanduloso-pilosus et parce aureo-glandulosus.—W. G. Craib.

The genus *Ornithoboea* was originally based on a solitary species from Tenasserim, sent to the late Sir William Hooker by the Rev. C. P. Parish over half a century ago, though a description of Parish's genus was not published until 1883, when Mr. C. B. Clarke named the species *O. Parishii*. Thirty years later Mr. Craib added two more species, *O. Henryi* discovered by Mr. A. Henry in Yunnan, near the Burmese frontier, and *O. Lacei*, sent by Mr. J. H. Lace from Upper Burma. Since 1913 Craib has described yet another, *O. lanata*, found by Dr. A. F. G. Kerr in North-western Siam. Another form sent from the same region by Kerr, which comes near *O. Lacei*, has flowered in the Botanic Garden of Trinity College, Dublin; yet another, known only in fruit, occurs in Tonkin. The first record of this Indo-Chinese genus in cultivation relates to Kerr's two Siamese forms, flowered at Dublin by Professor

Dixon ; *O. lanata*, sent by Kerr, has also flowered at Kew. The plant of *O. Lacei* now figured was raised at Kew from seed found in a capsule of the herbarium type of the species. Cultivated plants differ from the parent in having longer petioles and larger leaves. They flowered in June, 1914, in a warm greenhouse under the treatment suitable for tropical and subtropical Gesneriads, and matured good seed. In its twisted fruits *Ornithoboea* resembles *Boea* and *Streptocarpus*, but its capsules are shorter and stouter; from both genera it is distinguished by the bilabiate corolla with short upper lip.

Description.—*Herb*, apparently biennial; stem with the lower portion, produced during the first season, over 4 in. long, nearly $\frac{1}{4}$ in. thick, more or less 4-angled, densely clothed during the second season with the persistent bases of the old petioles, rather closely hairy especially towards the top; upper flowering portion of the stem usually about 12 in. long, everywhere glandular-hairy. *Leaves* usually unequal-sided, generally wide-ovate, acuminate, or somewhat acute or obtuse, one side often $\frac{1}{4}$ shorter than the other, margin crenate-serrate, $1\frac{1}{2}$–4 in. long, 1–$3\frac{1}{4}$ in. wide, chartaceous, rather hairy on both sides, and on the lower paler side also minutely yellow-glandular, lateral nerves about 10 on each side of the midrib, visible above and raised beneath as are the transverse veins; petiole up to $4\frac{1}{2}$ in. long, glandular-hairy. *Cymes* axillary, half as long as the petioles; pedicels $\frac{1}{2}$–$\frac{2}{3}$ in. long, glandular-hairy. *Sepals* subequal, oblong-lanceolate, acutely acuminate, over $\frac{1}{4}$ in. long, under $\frac{1}{6}$ in. wide, somewhat hairy on both sides. *Corolla* 2-lipped; tube under $\frac{1}{3}$ in. long; lower lip as long as the tube, 3-lobed, the lobes oblong-emarginate, nearly equal, under $\frac{1}{5}$ in. long and $\frac{1}{6}$ in. wide; upper lip 2-lobed, the lobes very short and deeply 2-fid. *Stamens* 2; anthers rather large; staminodes 3, the central uppermost, very small. *Ovary* $\frac{1}{12}$ in. long, densely glandular; style $\frac{1}{5}$ in. long. *Fruit* nearly $\frac{2}{3}$ in. long, $\frac{1}{10}$ in. thick, glandular-hairy and sparingly covered with yellow glands.

Fig. 1, section of calyx, showing pistil; 2, corolla, laid open; 3 and 4, stamens; 5, capsule of parent plant:—*all enlarged except* 5, *which is of natural size.*

M.S. del. J.N. Fitch lith.

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Tab. 8628.

METROSIDEROS diffusa.

New Zealand.

Myrtaceae. Tribe Leptospermeae.

Metrosideros, *Banks*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 710.

Metrosideros diffusa, *Smith in Trans. Linn. Soc.* vol. iii. p. 268; *Hook. f. Fl. Nov. Zel.* vol. i. p. 67; *Hook. f. Handb. N. Zeal. Fl.* p. 71; *T. Kirk, Stud. Fl. N. Zeal.* p. 161; *Cheesem. Man. N. Zeal. Fl.* p. 164; affinis *M. albiflorae*, Sol., sed foliis duplo minoribus et floribus coccineis facile distinguenda.

Frutex alte scandens, divaricatim ramosus, ramulis teretibus vel obscure tetragonis puberulis. *Folia* breviter petiolata, oblonga vel elliptico-oblonga, obtusa vel subobtusa, 1–2 cm. longa, 0·8–1·5 cm. lata, valde coriacea, subtus copiose punctulata. *Flores* terminales, cymosi, numerosi, brevissime pedicellati. *Calyx* 0·6–0·7 cm. longus, puberulus; tubus anguste oblongus; limbus abrupte expansus, cupularis; lobi rotundato-deltoidei. *Petala* orbiculata, parce et minute denticulata, circiter 2·5 mm. longa, coccinea. *Stamina* numerosa; filamenta coccinea, circiter 1 cm. longa; antherae oblongae, luteae. *Stylus* gracilis, circiter 1 cm. longus. *Capsula* globosa, coriacea, 0·8 cm. longa, sulcata, limbo calycis persistente coronata.—R. A. Rolfe.

The very striking *Metrosideros* here figured is a native of New Zealand, in which country the genus is well represented, three of its members having already a place in our pages: *M. florida*, Sm., at t. 4471; *M. tomentosa*, A. Rich., at t. 4488; and *M. buxifolia*, A. Cunn., at t. 4515. In our earlier volumes, too, five other figures have been given of Australian plants then referred to *Metrosideros*: *M. citrina*, Curt., at t. 260; *M. speciosa*, Sims, at t. 1761; *M. saligna*, Sm., at t. 1821; *M. hispida*, Sm., at t. 1960; and *M. viridiflora*, Sims, at t. 2602. But of these Australian species all with the exception *M. hispida*, which is *Angophora cordifolia*, Cav., have now been better transferred to the genus *Callistemon*. The species now illustrated, *M. diffusa*, is confined to the North Island of New Zealand, where it is not uncommon in forests from Mongonui and Ahipara to the south-east coast and Taranaki, occurring from sea-level to elevations of 2000 feet. For its introduction to this country horti-

culture is indebted to Capt. A. A. Dorrien-Smith, who informs us that while it usually grows as a creeper and prefers to have its roots in the shade, it is in its native haunts very accommodating, as it also forms a fairly compact rigid shrub in the middle of lava-flows. Its usual and apparently natural habit, however, is that of a creeper on trunks of trees, when, like various species of *Ficus*, it forms more rigid spreading branches as it grows older. It is only on such branches, when they are mature, that flowers are borne. The material for our figure has been derived from a plant cultivated by Mr. T. A. Dorrien-Smith in his garden at Tresco Abbey, Scilly, where it has thriven well in a raised pocket against a south wall shaded from the midday sun, its roots attaching themselves to the stones like ivy. Under these congenial conditions it flowered for the first time from the spreading branches in April, 1914, doing so again, even more profusely, in 1915. It is readily reproduced by cuttings struck under a bell glass in autumn, plants so raised flowering in their second or third season. It can also be raised from seed, but plants so obtained take many years to attain mature growth and produce flowers. It should be noted that this is not the plant figured as *M. diffusa* at t. 569 of the Icones Plantarum; that figure represents *M. albiflora*, Sol.

Description.—*Shrub*, far climbing, divaricately branched, the twigs terete or faintly 4-angled, puberulous. *Leaves* short-petioled, oblong or elliptic-oblong, obtuse or almost so, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{3}$–$\frac{2}{3}$ in. wide, very coriaceous, copiously dotted beneath. *Flowers* terminal, cymose, numerous, very shortly pedicelled. *Calyx* about $\frac{1}{4}$ in. long, puberulous; tube narrow-oblong; limb abruptly spreading, cup-shaped; lobes rounded-deltoid. *Petals* orbicular, sparingly and minutely denticulate, about $\frac{1}{10}$ in. long, pink. *Stamens* numerous; filaments pink, over $\frac{1}{3}$ in. long; anthers oblong, yellow. *Style* slender, over $\frac{1}{3}$ in. long. *Capsule* globose, coriaceous, $\frac{1}{3}$ in. long, grooved, crowned by the persisting calyx-lobes.

Fig. 1, bud; 2, longitudinal section of a calyx and pistil, showing style; 3, petal; 4 and 5, anthers; 6, transverse section of pistil:—*all enlarged.*

M.S. del. J.N. Fitch lith

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Tab. 8629.

PYRUS yunnanensis.

China.

Rosaceae. Tribe Pomeae.

Pyrus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 626.

Pyrus (§ Eriolobus) yunnanensis, *Franch. Pl. Delavay.* p. 228 (1889); species *P. Tschonoskii*, Maxim., valde affinis, floribus minoribus pro corymbo numerosioribus fructibus minoribus rubris foliisque ramulorum sterilium altius lobatis facillime distinguenda.

Arbor inermis, 6–9-metralis; innovationes primum dense tomentosi demum glabrati, brunneo-rubescentes. *Folia* decidua, ramulorum floriferorum ovata, margine minute irregulariter serrata, ramulorum sterilium saepius subobovata, plus minusve lobulata lobulis iterum serratis, omnia apice acuta, basi cordata vel rotundata, 5–11 cm. longa, 3·5–7·5 cm. lata, supra sordide viridia primum floccosa demum fere glabra, subtus dense velutina demum glabrescentia; nervi laterales utrinsecus 6–9; petiolus 1·7–3·5 cm. longus, pubescens. *Flores* 1·5 cm. lati, in corymbos 5–7·5 cm. latos ramulos dense tomentosos 3–4-foliatos terminantes dispositi; rhachis dense tomentosa; pedicelli dense tomentosi, circiter 2·5 cm. longi. *Calyx* dense tomentosus; lobi 2·5 mm. longi, triangulares, demum reflexi. *Petala* pallide rosea vel fere alba, 6 mm. longa, orbicularia, ungue breve tomentoso suffulta. *Stamina* circiter 20; filamenta glabra; antherae luteae. *Ovarium* 5-loculare; styli 5, ad medium usque connati. *Fructus* globosi, 1·2 cm. diametro, intense rubri maculis albis notati, calycis lobis persistentibus coronati; carnes scruposae, acerbae. *Semina* 3 mm. longa, securiformia, brunnea.—*Eriolobus yunnanensis*, Schneider in Handb. Laubholzk. vol. i. p. 727 (1906). *Pyrus Veitchii*, Hort.; Gard. Chron. 1912, vol. lii. p. 288 [nomen]; Veitch, Cat. New Hardy Plants from China—Autumn 1913, p. 12. *P. Veitchiana*, Hort.; Gard. Chron. 1912, l.c. [nomen].—W. J. Bean.

The handsome tree now figured belongs to that section of *Pyrus* which Roemer established as a separate genus, *Eriolobus*. To it belong also the Japanese *P. Tschonoskii*, Maxim., figured at t. 8179 of this work, and *P. trilobata*, DC., a native of Syria, very rare in gardens but represented in the Kew collection. *Eriolobus* differs from the *Aria* group, in which Franchet placed *P. yunnanensis*, by the styles being united for their lower third or more, and from *Malus* by the flesh of the fruit having grit-cells. The tree from which our figure was prepared is now growing in the collection of *Pyrus* immediately south of the Temperate House at Kew. It was purchased in 1913 from Messrs. Veitch, who raised it in 1900 in their Coombe Wood Nursery from seed sent from the district of Chang-yang in Western China by Mr. E. H. Wilson. A tree heavily laden with the handsome fruits was

exhibited under the name *P. Veitchii*, at the Horticultural Hall, Westminster, on Oct. 8, 1912, by Messrs. Veitch. *P. yunnanensis* was originally discovered by the Abbé Delavay in Yunnan, growing in mountain woods at 9000–10,000 feet elevation. From *P. Tschonoskii*, its nearest ally, it is distinguished by its smaller flowers, much more numerous in the corymb, the smaller red fruits, and the more deeply lobed leaves of the barren shoots. Dr. Schneider describes the calyx-lobes as falling from the apex of the fruit, and stress has been laid on this statement under t. 8179 of the present work, but none of the specimens in the Kew Collection exhibit this character. It promises to be perfectly hardy and its abundant seeds will make its increase easy. Planted in good deep loam it grows well and, more especially in autumn, makes an attractive feature in the garden.

Description.—*Tree*, 20 to 30 ft. high, unarmed; young shoots at first felted, becoming glabrous and reddish-brown. *Leaves* deciduous; ovate and finely and irregularly serrate on the flowering shoots, often more obovate and shallowly lobed as well as serrate on the barren shoots, acute at the apex, cordate or rounded at the base; 2–4½ in. long, 1½–3 in. wide; primary veins six to nine; dull green and at first floccose, ultimately nearly glabrous above, covered with a pale brown felt beneath, much of which falls away by autumn; petiole ¾–1½ in. long, pubescent. *Flowers* ⅝ in. wide, in racemose corymbs 2–2½ in. in diameter, terminating short, felted twigs which carry three or four leaves; rachis and pedicels felted, the latter about 1 in. long. *Calyx* felted, its lobes $\frac{1}{12}$ in. long, triangular, becoming reflexed. *Petals* pale pink, ¼ in. wide, orbicular, with a short, bearded claw. *Stamens* about twenty, filaments glabrous, anthers yellow. *Ovary* 5-celled; styles five, connate in the lower half. *Fruit* globose, ½ in. in diameter, deep red specked with whitish dots, the calyx-lobes persisting at the apex; flesh gritty, harsh and acid. *Seeds* ⅛ in. long, hatchet-shaped, brown.

Fig. 1, portion of the under-surface of a leaf; 2, bud; 3, vertical section of a flower, the petals removed; 4 and 5, anthers:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp.

L. Reeve & Co. London.

Tab. 8630.

GENTIANA gracilipes.

China.

Gentianaceae. Tribe Swertieae.

Gentiana, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 815.

Gentiana gracilipes, *Turrill*; species *G. dahuricae*, Fisch., affinis, sed pedicellis longioribus, calycibus unilateraliter fissis differt.

Herba perennis, et rosulas steriles et caules florentes erectos vel adscendentes teretes glabros gaudens. *Folia* rosularum sterilium anguste lanceolata, acuta, caulina linearia vel lanceolato-linearia, acuta, usque ad 5 cm. longa et 3–4 mm. lata, uninervia, glabra, opposita, basi connata. *Flores* in axillis superioribus solitarii, pedicellis circiter 5 cm. longis glabris. *Calyx* truncatus, margine distincte 3–5-dentatus, latere altero integer, altero fissus, 9 mm. longus. *Corollae* tubus superne gradatim ampliatus, 3·2 cm. longus, basi 1·5 mm. latus, fauce 8 mm. diametro; lobi ovato-triangulares, 6 mm. longi, 5 mm. lati, patentes, plicis ovato-triangularibus 3 mm. longis alternantes. *Stamina* libera, inter se aequalia, filamentis 7 mm. longis ad corollae tubi basin usque decurrentibus, antheris stramineis 2 mm. longis. *Ovarium* fere sessile, cylindricum, stylo 3 mm. longo incluso 3 cm. altum, 2 mm. diametro, glabrum, stigmate bilobo, lobis 1 mm. longis.—W. B. Turrill.

The interesting Chinese Gentian now figured is a member of the section of the genus *Gentiana* distinguished by Professor Kusnezow as *Aptera*. According to the arrangement adopted by Kusnezow *G. gracilipes* should be placed nearest to *G. dahurica*, Fisch., with which except for its longer pedicels it agrees closely in its general facies; or alternatively next to *G. Fetisowii*, Maxim., with which it shares the character of a spathaceously divided calyx. For the material on which our plate of *G. gracilipes* is based we are indebted to the kindness of Mr. H. J. Elwes, in whose garden at Colesborne, Cheltenham, a plant which flowered there in August, 1914, was raised from seed collected in Kansu and received at Colesborne through the late Mr. R. Woodward. This plant, which was presented by Mr. Elwes to Kew, has proved quite hardy and thrives vigorously in a cool sheltered corner. It has not yet ripened seed, but

appears to be as easily managed as the other members of the section *Aptera*, of which several are already in cultivation. The chief distinctive feature of *G. gracilipes* is the length of its slender pedicels, which arise singly in the axils of the uppermost leaves of the flowering shoot. The lateral position of the flowering shoot this species shares with *G. dahurica*; the spathaceous division of the calyx on one side it shares not only with *G. Fetisowii*, but with *G. straminea*, Maxim., and some other members of the section *Aptera*. At the same time this latter character is not universal in the section; several of the species, in addition to *G. dahurica*, have a normally tubular calyx.

Description.—*Herb*, perennial, with barren rosettes, and at the same time, erect or ascending terete glabrous flowering stems. *Leaves* of the rosette narrow-lanceolate, acute; of the stem linear-lanceolate, acute, 1-nerved, opposite and stem-clasping at the base, up to 2 in. long, $1\frac{1}{4}$–$1\frac{1}{2}$ in. wide. *Flowers* solitary in the axils of the uppermost leaves, pedicels glabrous, about 2 in. long. *Calyx* truncate, distinctly 3–5-toothed, split on one side, over $\frac{1}{3}$ in. long. *Corolla* purplish-blue; tube gradually enlarging upwards, $1\frac{1}{3}$ in. long, $\frac{1}{12}$ in. wide at the base, limb $\frac{1}{3}$ in. across; lobes ovate-triangular, $\frac{1}{4}$ in. long, $\frac{1}{5}$ in. wide, spreading, alternating with 5 ovate-triangular folds, $\frac{1}{8}$ in. long. *Stamens* free, equal; filaments decurrent on the corolla-tube to the base; anthers straw-coloured, $\frac{1}{12}$ in. long. *Ovary* subsessile, cylindric, $1\frac{1}{4}$ in. long including the style which is $\frac{1}{8}$ in. long, very narrow, glabrous; stigma 2-lobed, its lobes very short.

Fig. 1, calyx, laid open, and pistil; 2 and 3, anthers:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Ltd imp

L. Reeve & Co London.

Tab. 8631.

PROMENAEA MICROPTERA.

Tropical South America.

Orchidaceae. Tribe Vandeae.

Promenaea, *Lindl. Bot. Reg.* 1843, p. 13. Zygopetalum § Promenaea, *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 543.

Promenaea microptera, *Reichb. f. in Gard. Chron.* 1881, vol. xvi. p. 134, ad calc.; species a *P. xanthina*, Lindl., sepalis petalisque angustioribus et labelli lobo intermedio multo angustiore apte sejungenda.

Herba epiphytica. *Pseudobulbi* aggregati, ovoidei, sulcati, 1·5–2 cm. longi, apice diphylli. *Folia* lanceolata, acuminata, subarcuata, plicata, pallide viridia, 7–9 cm. longa, 1·3–1·5 cm. lata. *Scapi* laterales, arcuati, graciles, 6–7 cm. longi, uniflori, prope basin parce vaginati; bractea lanceolata, acuminata, concava, circiter 1 cm. longa. *Flores* mediocres, pallide virides, labello transverse purpureo-maculato. *Sepala* et *petala* patentia, oblongo-lanceolata, acuminata, 1·7–2 cm. longa. *Labellum* trilobum, 1·8 cm. longum; lobi laterales suberecti, late rotundato-deltoidei, subobtusi, breves; lobus intermedius elliptico-oblongus, apice recurvus et subacutus; discus crista transversa prominenter tuberculata instructus. *Columna* clavata, marginata. *Pollinia* 4, obovoidea, subcompressa, glandula lata acuta affixa.—*Zygopetalum micropterum*, Reichb. f., l.c.—R. A. Rolfe.

The genus *Promenaea* was founded by Lindley over seventy years ago on four small Brazilian species which had until then been included in *Maxillaria*, Ruiz et Pav., along with a fifth from British Guiana; some other species have since then been described from Colombia. The late Professor Reichenbach subsequently included *Promenaea*, with other allied genera, in *Zygopetalum*, proposed by Sir William Hooker in 1827. In this Reichenbach was followed by Bentham and Hooker in 1883, though they accorded *Promenaea* the status of a section. Reichenbach, however, had already reconsidered his earlier conclusion, and *Promenaea* is now thought as entitled to generic rank as some other similar groups whose status has never been questioned. One species of this genus, *P. graminea*, Lindl., from Guiana, has been figured at t. 3877 of this work as *Maxillaria stapelioides*; the true *P. stapelioides* is, however, a native of Brasil. The interesting little species now figured has a somewhat obscure history, for we are still without definite record of its native country. The

plant is one in the Kew collection which thrives well in a tropical house under the conditions suitable for species of *Maxillaria* and *Zygopetalum*, and flowered there in June, 1914. It had been presented to the Gardens by the Dowager Lady Lawrence, earlier in the year, as part of the collection of the late Sir Trevor Lawrence, at Burford, Dorking, so rich in species previously unrepresented at Kew and rarely met with in cultivation. This species, *P. micropteru*, was described in 1881 by Reichenbach, whose material, which came originally from Mr. d'Haene of Ghent, had been sent by Mr. H. Veitch; a day later he received it also from Mr. B. S. Williams of Holloway. In 1890 material, probably from the original source, was communicated to Kew from the Royal Botanic Garden, Glasnevin, and there is little reason to doubt that the plant now figured had also formed part of the same importation, for the Burford label indicates that it reached Sir Trevor Lawrence from the collection of Mr. Williams. The nearest ally of *P. micropteru*, as Professor Reichenbach and Mr. Rolfe point out, is a Brasilian species, *P. xanthina*, Lindl.; this does not, by itself, entitle us to assume that *P. micropteru* is also a native of Brasil rather than of Colombia or Guiana, though it suggests that possibility.

Description.—*Herb*, epiphytic: pseudobulbs clustered, ovoid, grooved, $\frac{1}{3}$–$\frac{3}{4}$ in. long, 2-foliate. *Leaves* lanceolate, acuminate, somewhat arcuate, plicate, pale green, 3–$3\frac{1}{2}$ in. long, $\frac{1}{2}$–$\frac{2}{3}$ in. wide. *Scapes* lateral, arcuate, slender, $2\frac{1}{2}$–3 in. long, 1-flowered, sparingly sheathed near the base; bract lanceolate, acuminate, concave, over $\frac{1}{2}$ in. long. *Flowers* medium-sized, pale green, the lip with transverse purple bars. *Sepals* and *petals* spreading, oblong-lanceolate, acuminate, $\frac{2}{3}$–$\frac{3}{4}$ in. long. *Lip* 3-lobed, $\frac{3}{4}$ in. long; lateral lobes suberect, wide rounded-deltoid, rather blunt, short; mid-lobe elliptic-oblong, with a recurved, rather acute tip; disk with a transverse rather prominently tubercled crest. *Column* clavate, marginate. *Pollinia* 4, obovoid, somewhat compressed, adnate to a broad acute gland.

Fig. 1, lip and column; 2, anther-cap; 3 and 4, pollinia:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp.

L. Reeve & Co. London.

Tab. 8632.

STREPTOCARPUS denticulata.

Transvaal.

Gesneriaceae. Tribe Cyrtandreae.

Streptocarpus, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1023.

Streptocarpus denticulata, *Turrill*; species *S. pusillae*, C. B. Clarke, affinis; foliis utrinque fere glabris, corollae tubo breviore, limbo majore distincta.

Herba acaulis, unifoliata. *Folium* (cotyledon) ovatum, obtusum, basi cordatum, ad 2 dm. longum, 1·8 dm. latum, margine denticulatum, pagina utraque fere glabrum. *Inflorescentiae* ad 2·4 dm. altae, multiflorae, pilis glanduloso-capitatis dense instructae; bracteae lineares. *Calyx* 5-partitus, ut pedunculi et pedicelli dense glanduloso-pubescens, segmentis linearibus acutis 4 mm. longis 1 mm. latis. *Corollae* tubus cylindricus, medio constrictus, 8 mm. longus, basi 4 mm. diametro; limbus bilabiatus, roseo-purpureus, labio antico trilobo carmineo-lineato, lobis late orbicularibus aequalibus 7 mm. longis 8 mm. latis crenulatis, postico bilobo inferne atropurpureo, lobis aequalibus late orbicularibus 7 mm. longis 5 mm. latis leviter decurrentibus, antheris 2·75 mm. longis; staminodia 1–2 mm. longa. *Discus* annulatus, glaber. *Ovarium* cylindricum, leviter obliquum, 4 mm. altum, 1·5 mm. diametro, dense brevius glanduloso-pubescens; stylus 4 mm. longus, glanduloso-pubescens, stigmate bilobo.—W. B. Turrill.

The genus *Streptocarpus* is confined to Africa south of the Tropic of Cancer and to the Mascarenes. Two sections are generally recognized; one, *Unifoliatae*, has only one green assimilating leaf which is a persistent cotyledon; the other, *Rosulatae*, has 1–4 leaves in addition to the cotyledon which is usually present. The species figured is one of the *Unifoliatae*, of which about fifteen are already known from various parts of South Africa. The nearly or quite glabrous leaf (cotyledon) of *S. denticulata* is unlike the densely hairy one of *S. pusilla*, Harv., to which our plant appears most nearly allied. The glandular-pubescent character of the inflorescence is a noticeable feature, though our species shares this with some of the others. The general colour of the flowers is distinctive, and may be described as rose-purple with lines of deeper carmine on the lower lip, and dark-purple blotches on the lower part of the upper lip. In other species of *Streptocarpus* figured in this work the corolla is more or less blue or violet, as, in *S.*

Galpini, Hook. f., at t. 7230; *S. Wendlandii*, Dammann, at t. 7447; and *S. Mahoni*, Hook. f., at t. 7857. The material for our plate has been derived from a plant presented to Kew by Mr. R. I. Lynch, Botanic Garden, Cambridge, in 1914. This plant was raised by Mr. Lynch from seed communicated by Mr. W. E. Ledger, Wimbledon, who had received it from South Africa, where it had been collected by Mr. J. N. Thorncroft on one of the mountains near Barberton, in the Transvaal. It has thriven well under the conditions suitable for other species of the genus, and has ripened seeds from which a second generation of plants has been raised. Crosses, Mr. Lynch informs us, have been made between *S. denticulata* and various species, more especially *S. cyaneus*, S. Moore, with which it seems to pair more readily than with others. In the case of *S. cyaneus*, crosses have been made both ways, and in each the influence of the female parent has shown itself the stronger.

Description.—*Herb*, stemless and with only one leaf, which is an enlarged persistent cotyledon. *Leaf* ovate, obtuse, margin denticulate, base cordate, sometimes 8 in. long, 7 in. wide, glabrous or nearly so on both surfaces. *Inflorescences* clustered, many-flowered, 9–10 in. in height, densely clothed with glandular hairs; bracts linear. *Calyx* 5-partite, densely glandular-pubescent; lobes narrow-linear, acute, $\frac{1}{6}$ in. long. *Corolla* rose-purple, tube white, limb with purple blotches and crimson streaks; tube cylindric, narrowed in the middle, $\frac{1}{3}$ in. long, $\frac{1}{6}$ in. wide at the base; limb 2-lipped; lower lip 3-lobed, the lobes subequal, wide-orbicular, over $\frac{1}{4}$ in. long, $\frac{1}{3}$ in. wide, their margin crenulate; upper lip 2-lobed, lobes equal, wide-orbicular, over $\frac{1}{4}$ in. long, $\frac{1}{5}$ in. wide, faintly crenulate. *Stamens* 2 perfect, glabrous; filaments $\frac{1}{7}$ in. long, slightly decurrent; anther under $\frac{1}{8}$ in. long; staminodes short. *Disk* annular, glabrous. *Ovary* cylindric, slightly oblique, $\frac{1}{6}$ in. long, under $\frac{1}{12}$ in. wide, densely glandular-pubescent with short hairs; style $\frac{1}{6}$ in. long, glandular-pubescent; stigma 3-lobed.

Fig. 1, calyx and pistil; 2, corolla, laid open; 3 and 4, anthers; 5, ovary; 6, sketch of an entire plant:—*all enlarged except* 6, *which is much reduced.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lith.

L. Reeve & Co. London

Tab. 8633.

CLEMATIS uncinata, forma retusa.

China.

Ranunculaceae. Tribe Clematideae.

Clematis, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 3.

Clematis uncinata, *Champion ex Benth. in Hook. Kew Journ. Bot.* vol. iii. p. 255, forma **retusa**, *Sprague*; foliolis apice retusis a typo distincta.

Frutex scandens. *Caules* sulcati, purpurascentes, glabri. *Folia* pinnatim quinquefoliolata vel septemfoliolata (ea inflorescentiae trifoliolata vel simplicia); foliola elliptica vel late ovata, apice retusa, basi cordata vel rotundata, 3–6·5 cm. longa, 2–3 cm. lata, tenuiter coriacea, glabra; petiolus in basin ampliatus, supra valde excavatus; petioluli 1–2·5 cm. longi. *Thyrsi* foliati; pedicelli 1·5–2·5 cm. longi, basi pari bractearum suffulti; bracteae anguste lanceolatae, 4–5 mm. longae. *Sepala* alba, ligularia, minute apiculata, 1·5–1·8 cm. longa, 3–5 mm. lata, primum patentia, demum deflexa. *Stamina* numerosa; filamenta linearia, 2–8 mm. longa; minute apiculatae. *Pistilla* pluria, vix 1 cm. longa; ovarium glabrum; stylus longe dense plumosus. *Achaenia* formae retusae haud cognita, formae typicae oblonga, breviter rostrata, 6–7 mm. longa, stylo patenter plumoso triplo longiore.—T. A. Sprague.

The striking form of *Clematis uncinata* which is the subject of our plate differs from the plant originally described as *C. uncinata* by Champion, by its leafy inflorescence, that of the type being comparatively leafless, and by its leaflets being all retuse in place of acutely acuminate and recurved or almost hooked at the tip, the feature to which the species owes its name. Yet in spite of the distinctive appearance thus imparted to the present form, the two extremes are connected by a series of intermediate conditions, the existence of which renders it impossible to accord our plant even the rank of a variety. For the material from which our illustration has been prepared we are indebted to Captain D. V. Pirie, in whose garden at the Château de Varennes, a few miles west of Angers, it makes a most beautiful picture, clambering over a wall and succeeding under the strong sun of Western France much better than it does at Kew. Fragrant as well as graceful, *C. uncinata* is evidently a species which loves bright sunshine. In

England it does not appear to be very hardy in the open ground and will probably require to be grown on a south wall in order to bring out its best qualities.

DESCRIPTION.—*Shrub*, climbing; stems grooved, purplish, glabrous. *Leaves* pinnately 5-foliolate or 7-foliolate, those of the inflorescence 3-foliolate or simple; leaflets elliptic or wide-ovate, retuse, base cordate or rounded, $1\frac{1}{4}$–$2\frac{1}{2}$ in. long, $\frac{3}{4}$–$1\frac{3}{4}$ in. wide, thinly coriaceous, glabrous; petiole widened at the base, deeply channelled above; petiolules $\frac{1}{2}$ in. long. *Flowers* disposed in a leafy thyrse; pedicels $\frac{2}{3}$–1 in. long, with a pair of bracts at the base; bracts narrow-lanceolate, $\frac{1}{6}$–$\frac{1}{5}$ in. long. *Sepals* white, narrow oblong, minutely apiculate, $\frac{2}{3}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$–$\frac{1}{5}$ in. wide, at first spreading, ultimately deflexed. *Stamens* many; filaments linear, $\frac{1}{12}$–$\frac{1}{3}$ in. long; anthers linear, $\frac{1}{8}$–$\frac{1}{7}$ in. long, finely apiculate. *Carpels* very many, about $\frac{1}{3}$ in. long; ovary glabrous; style densely plumose with long hairs. *Achenes* of the form now described unknown; those of the typical form oblong, shortly beaked, about $\frac{1}{4}$ in. long; style feathered with spreading hairs.

Figs. 1 and 2, stamens; 3, pistil:—*all enlarged.*

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Tab. 8634.

RHODODENDRON CARNEUM.

Upper Burma.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron carneum, *Hutchinson*; species distincta affinis *R. Veitchiano*, Hook., sed calycis lobis multo minoribus longe ciliatis, corolla minore carnea extra roseo tincta intus emaculata, lobis subplanis divergentibus margine haud crispatis differt.

Frutex metralis; ramuli dense brunneo-lepidoti. *Folia* elliptico-obovata, subacuta, basi obtusa vel subcuneata, 6–12 cm. longa, 3–4 cm. lata, coriacea, supra intense viridia, arcte reticulata, glabra, infra glauca, glandulis flavis lepidota; costa infra prominens, basi circiter 1·5 mm. lata; nervi laterales utrinsecus 5–8, utrinque conspicui, flexuosi, prope marginem tenuissimi; petioli 1–1·5 cm. longi, dense lepidoti. *Perulae* late ovatae, obtuse mucronulatae, extra lepidotae. *Calyx* bene evolutus, 5-lobus, lobis rotundato-ovatis apice longe piloso-ciliatis extra dense lepidotis. *Corolla* carnea; tubus 3·5–4 cm. longus, basi 0·8 cm. fauce 3 cm. diametro, extra parce lepidotus, intus glaber; lobi patentes, oblongi, apice truncati vel rotundati, 3 cm. longi, 2·3–3·5 cm. lati. *Stamina* plerumque 12, inaequalia, breviter exserta; filamenta subfiliformia, inferne patule pilosa, ad 4·5 cm. longa; antherae 4 mm. longae. *Ovarium* 0·5 cm. altum, dense lepidotum; stylus exsertus, 5·5 cm. longus, dense lepidotus, superne roseus, stigmate capitato brunneo viscido 3·5 mm. diametro.—J. Hutchinson.

The very attractive Rhododendron which forms the subject of our plate is a native of Northern Burma, where it was met with at an altitude of about 7500 feet above the level of the sea in the Northern Shan States by Major C. W. Browne, Survey of India, by whom a supply of seed was sent to Col. F. B. Longe, Holly Lodge, Thorpe, Norwich. From these seeds, sown in July, 1909, Col. Longe was able to raise several plants; one of these plants, which flowered in 1914 under the conservatory treatment suitable for *R. formosum* and *R. Veitchii*, was sent to Kew for examination, and afforded an opportunity for the preparation of the figure here given. According to the information received by Col. Longe, this species in its natural state affects open grassy hill sides away from any large trees, prefers western slopes, and only grows to a height of about three feet. The

flowers in their native habitat are of a crimson pink which gradually turns to a delicate white, or to white suffused with pink. The affinity of *R. carneum* with *R. Veitchianum*, Hook., also a Burmese species which has been figured at t. 4992 of this work, is very marked, and if only herbarium material of the two be consulted, the impression might be formed that they are barely separable. When, however, the figures made from living material of the two species are compared, several differences are manifest. In *R. Veitchianum* the calyx-lobes are usually considerably larger, and are always less ciliate, while the corolla, which is white, is always larger and is yellow inside the tube, its lobes being suberect in place of spreading and having strikingly crispate margins.

Description.—*Shrub*, about 3 ft. high; twigs densely brown-lepidote. *Leaves* elliptic-obovate, subacute, base obtuse or slightly cuneate, $2\frac{1}{4}$–$4\frac{1}{2}$ in. long, $1\frac{1}{4}$–$1\frac{1}{2}$ in. wide, coriaceous, deep green above, closely reticulate, glabrous, glaucous and lepidote with yellow glands beneath; mid-rib raised beneath, with 5–8 lateral nerves along each side which are visible on both surfaces, are somewhat curved, and become very slender towards the margin of the leaf; petiole $\frac{1}{3}$–$\frac{2}{3}$ in. long, densely lepidote. *Bud-scales* wide ovate, bluntly mucronulate, lepidote outside. *Calyx* well developed, 5-lobed, two segments rounded-ovate, ciliate at the tip with long hairs and densely lepidote outside. *Corolla* flesh-coloured; tube $1\frac{1}{3}$–$1\frac{1}{2}$ in. long, $\frac{1}{3}$ in. across at the base, $1\frac{1}{4}$ in. across at the mouth, sparingly lepidote outside, glabrous within; lobes spreading, oblong, truncate or rounded, $1\frac{1}{4}$ in. long, 1–$1\frac{1}{3}$ in. wide. *Stamens* usually 12, unequal, slightly exserted; filaments slender, beset with spreading hairs in their lower half, up to $1\frac{3}{4}$ in. long; anthers $\frac{1}{6}$ in. long. *Ovary* $\frac{1}{5}$ in. long, densely lepidote; style exserted, $2\frac{1}{4}$ in. long, densely lepidote, pink upwards; stigma capitate, brown, viscid, $\frac{1}{7}$ in. across.

Fig. 1, portion of a leaf, showing lower surface; 2, scales from a leaf; 3, calyx and pistil; 4, calyx and ovary; 5, outside of a corolla-lobe, showing scales; 6 and 7, stamens:—*all enlarged.*

M.S del. J.N. Fitch lith

Vincent Brooks, Day & Son Lt[d]

L. Reeve & C[o] London

Tab. 8635.

SIEVEKINGIA Shepheardii.

Colombia.

Orchidaceae. Tribe Vandeae.

Sievekingia, *Reichb. f. Beitr. Syst. Pflanzenk.* (1871) p. 3.

Sievekingia Shepheardii, *Rolfe*; species nova ab alteris adhuc descriptis pseudobulbis diphyllis, scapis erectis et multifloris distincta.

Herba epiphytica. *Pseudobulbi* aggregati, ovoidei vel ovoideo-oblongi, angulati, basi vaginis ovatis acutis membranaceis obtecti, 2–4 cm. longi, 1–1·5 cm. lati, diphylli. *Folia* petiolata, elliptico-lanceolata, acuminata, plicata, subundulata, 12–20 cm. longa, 3–5 cm. lata; petiolus 2–5 cm. longus. *Scapus* erectus, circiter 10 cm. longus, multiflorus, rhachis nigro-puberula. *Bracteae* lanceolatae, acuminatae, 1–1·5 cm. longae. *Pedicelli* circiter 1 cm. longi, nigro-puberuli. *Flores* mediocres, lutei. *Sepala* subconniventia, lanceolata, acuminata, 1·5 cm. longa, extra nigro-puberula. *Petala* anguste obovato-oblonga, subobtusa, 1 cm. longa. *Labellum* subpandurato-oblongum, subconcavum, margine integrum, apice subacutum et recurvum, 1 cm. longum, basi callo breve et papilloso instructum. *Columna* clavata, 0·8 cm. longa, alis latis et integris; pollinia 2, ellipsoidea; stipes subgracilis; glandula oblonga.—R. A. Rolfe.

The Orchid now figured is a member of a small but interesting genus which was originally founded by the late Professor Reichenbach in 1871 on a species from Costa Rica described as *Sievekingia suavis*. To the genus Reichenbach subsequently added two more species, *S. fimbriata*, also a Costa Rica plant, and *S. Jenmanii*, a native of British Guiana. Since then a plant from Ecuador, originally described by Mr. F. C. Lehmann as *Gorgoglossum Reichenbachianum*, has been found to be in reality a *Sievekingia*, and has been figured at t. 7576 of this work as *S. Reichenbachiana*. More recently two additional species have appeared in collections. One of these, a native of Peru, has been described as *S. peruviana*, Rolfe. The other, *S. Shepheardii*, now first described is a native of Colombia. It is one of nine Orchids collected in the Colombian district of Rio Condoto Choco by Dr. S. Shepheard in 1912 and was acquired for the Kew collection from Mrs. Shepheard, Abbots Hall, Aylsham, in 1914. It flowered in the Tropical Orchid House at

Kew in February, 1915, and so permitted our plate to be prepared. Planted in a teak basket and suspended near the roof-glass, it thrives well under the treatment suitable for members of the genus *Stanhopea*. Its cultural requirements are thus in accordance with its natural affinities for, when first described, the genus was noted as being allied to *Lacaena*, Lindl., which in the Genera Plantarum was placed in the subtribe *Cyrtopodieae*, but has since been more satisfactorily transferred to the subtribe *Stanhopieae*, wherein *Sievekingia* is most appropriately included. The two species from Costa Rica are unknown now in orchid collections; those from South America appear, perhaps owing to difficulties connected with their culture, to have failed to secure a permanent position in our gardens.

Description.—*Herb*, epiphytic; pseudobulbs 2-foliate, clustered, ovoid or ovoid-oblong, angled, clothed at the base with acute membranous sheaths, $\frac{3}{4}$–$1\frac{1}{2}$ in. long, about $\frac{1}{2}$ in. wide. *Leaves* petioled, elliptic-lanceolate, acuminate, plicate, margin slightly waved, 5–8 in. long, $1\frac{1}{4}$–2 in. wide; petiole $\frac{3}{4}$–2 in. long. *Scape* erect, about 4 in. long, many-flowered; rachis puberulous with black hairs; bracts lanceolate, acuminate, $\frac{1}{3}$–$\frac{2}{3}$ in. long; pedicels about $\frac{1}{3}$ in. long, puberulous with black hairs. *Flowers* of medium size, yellow. *Sepals* somewhat connivent, lanceolate, acuminate, about $\frac{2}{3}$ in. long, puberulous with black hairs. *Petals* narrowly obovate-oblong, rather blunt, about $\frac{1}{3}$ in. long. *Lip* somewhat pandurate-oblong, rather concave, with margin entire and tip rather acute and recurved, about $\frac{1}{3}$ in. long, the base with a short papillose callus. *Column* clavate, $\frac{1}{3}$ in. long, with broad entire wings; pollinia 2, ellipsoid; stipe rather slender; gland oblong.

Fig. 1, lip; 2, column; 3, anther-cap; 4, pollinarium:—*all enlarged.*

Tab. 8636.

ANEMONE obtusiloba, forma patula.

Himalaya, Burma and China.

Ranunculaceae. Tribe Anemoneae.

Anemone, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 4.

Anemone obtusiloba, *Don, Prodr. Fl. Nepal.* p. 194; *Hook. f. et Thoms. Fl. Ind.* vol. i. p. 22, et in *Hook. f. Fl. Brit. Ind.* vol. i. p. 8; *Finet et Gagnep. in Bull. Soc. Bot. Fr.* vol. li. p. 62; species sat variabilis ab *A. rupestri*, Wall. ex Hook. f. et Thoms., habitu robustiore, foliisque minus divisis recedit; forma **patula** ramis floriferis elongatis pedunculis adscendentibus instar.

Herba perennis. *Folia* juventute erecta, demum patula, rosulata, ambitu magis minusve ovata, circa 5 cm. longa et lata, tripartita segmentis trifidis, subtus pallidiora, pagina utraque pilis longis albis instructa, nervis subtus prominulis, supra leviter impressis; petioli 6–7 cm. longi, pilis longis albis divergentibus instructi nisi inferne ubi complanati, pallidi et supra glabri. *Ramuli floriferi* decumbentes, pedicellis exclusis 20 cm. longi, basi 4 mm. diametro, plurisulcati, virides vel brunneo-virides, pilis longiusculis albidis adscendentibus instructi, apice involucro circiter 2·5 cm. longo e bracteis 4 foliosis composito ornati, flores 1–3 gerentes. *Pedicelli* terminales ad 20 cm. longi, laterales haud rarissime evoluti ad 8 cm. longi, omnes apicem versus bibracteolati et ut pedunculus communis sulcati et pubescentes. *Flores* coeruleo-purpurascentes, expansi 3·5–4 cm. diametro; sepala saepius 5, raro 6, plus minusve obovata, basi in unguem latum saepe vix conspicuum angustata, dorso medio pubescentia. *Filamenta* circiter 5 mm. longa, complanata, apice angustata, omnino glabra, antheris vix 2 mm. longis. *Carpella* pilis brunneis rigidis erectis obtecta, stylo perbrevi.—W. G. Craib.

The Anemone here figured was collected by Mrs. Wheeler Cuffe at a high altitude on Mount Victoria, a peak 12,500 feet in height in the Arakan Yomah in Western Burma. Attempts, all of which had proved unsuccessful, had been made to send seeds to Europe but, during a visit which Mrs. Cuffe was able to pay to Mount Victoria in 1913, she was able to obtain plants which she brought home herself and presented to the Royal Botanic Gardens, Glasnevin. Here they throve well in a cold frame, where they have passed uninjured through two winters, flowering freely in May and June. From one of these plants, sent by Sir Frederick Moore for

the purpose, our plate has been prepared. The species, *A. obtusiloba*, to which this interesting Burmese plant is here referred, was first described by Mr. D. Don in 1825 from specimens sent home by Dr. Wallich from Gossain Than in the Alps of Central Nepal. Its range of distribution, for an alpine species, is unusually wide, for it extends from Kashmir throughout the Himalaya to Western China, and its discovery on Mount Victoria somewhat unexpectedly widens its area towards the south. As Sir Joseph Hooker has pointed out, *A. obtusiloba* is further extremely variable in size, hairiness and colour of flower; one singular form from Western Tibet with numerous golden yellow sepals is perfectly glabrous. Elsewhere the flowers may be white, purplish or golden, and in Kashmir, where both yellow and purple-flowered forms occur, the latter is well-known to English visitors as the Blue Buttercup. This name is also used in Burma where, so far, only a form with purplish-blue flowers has been found. The distinctive feature of this Burmese plant, therefore, is not to be found in the colour of the sepals, but in the marked elongation of the flowering branches, a feature not met with in specimens from other portions of the wide area in which *A. obtusiloba* grows, though the decumbent habit of these branches is manifest in many examples collected in the Western Himalaya. This diversity of habit, in so far as Himalayan specimens are concerned, is probably the result of differences in the conditions under which individual plants have been grown, and it is not inconceivable that the great length of the flowering branches and their decumbent position in the form now figured may be the consequences of cultivation. In the absence of herbarium specimens of uncultivated plants from Mount Victoria, Mr. Craib has therefore been constrained to treat this charming plant as a form of *A. obtusiloba*; should the communication of material from its original habitat show that the features which mark it are natural ones, it may be desirable to treat it rather as a distinct variety. The plant gives some promise of proving hardy; an example planted out at Glasnevin in May, 1915, has grown as well and flowered as freely as those in the frame.

DESCRIPTION.—*Herb*, perennial. *Leaves* at first erect, at length spreading and rosulate, more or less ovate, about 2 in. long and broad, 3-partite with each segment 3-fid, rather pale beneath, beset on both faces with long white hairs, the nerves raised beneath, slightly sunk above; petiole $2\frac{1}{4}$–$2\frac{3}{4}$ in. long, beset with long spreading white hairs except at the base where they are infolded and are pale and glabrous on the upper side. *Flowering branches* decumbent, 8 in. long under the bracts, $\frac{1}{6}$ in. thick at the base, grooved throughout, green or brownish-green, beset with rather long, ascending white hairs, each bearing a whorl of 4 apical leafy bracts about 1 in. long with 1–3 flowers. *Pedicels* variable, the terminal up to 8 in. long, the lateral 1 or 2 which frequently accompany it up to 3 in. long, all 2-bracteolate near the top and sulcate and pubescent like the branch below. *Flowers* purplish-blue, $1\frac{1}{4}$–$1\frac{1}{2}$ in. across; sepals usually 5, occasionally 6, more or less obovate, base narrowed to a wide and often hardly noticeable claw, pubescent outside along the middle. *Filaments* about $\frac{1}{5}$ in. long, flattened, narrowed at the tip, quite glabrous, anthers very short. *Carpels* closely beset with brown, stiff, erect hairs; style very short.

Fig. 1, a stamen; 2, a young carpel; 3, a fruiting carpel; 4, sketch of an entire plant:—*all enlarged except* 4, *which is much reduced.*

M.S del. J.N Fitch lith

Vincent Brooks, Day & Son Lt.d imp

L. Reeve & Co. London.

Tab. 8637.

POTENTILLA davurica, var. Veitchii.

China.

Rosaceae. Tribe Potentilleae.

Potentilla, *Linn.*; *Benth. et Hook. Gen. Plant.* vol. i. p. 620; *Wolf in Luerssen Bibliotheca Botanica*, vol. xvi. (Heft 71).

Potentilla davurica, *Nestl.*, var. **Veitchii**, *Jesson*; varietas distincta a *P. davurica* typica habitu altiore laxiore et foliolis saltem juvenilibus utrinque magis minusve sericeo-pilosis apte sejungenda.

Frutex sempervirens, 1–1·5 m. altus; caules ramique lignosi, juniores pilis sericeis magis minusve vestiti, vetustiores sparse pilosi, cortice fusco facile solubili. *Folia* 1·5–2·5 cm. longa, 3–5-foliolata, petiolo 0·5–1·2 cm. longo pubescente suffulta; foliola sessilia obovato-oblonga vel oblanceolata, apice mucronulata, integra, 0·7–1·5 cm. longa, 0·35–0·7 cm. lata, supra viridia, subtus pallidiora, utrinque adpresse sericeo-pilosa (in planta culta parce pilosa), nervis lateralibus infra plus minusve conspicuis; stipulae ovatae, acuminatae, 7 mm. longae, scariosae. *Flores* plerumque apices ramulorum brevium, uni- vel pauci-foliatorum terminantes, solitarii, raro altero subterminali addito, hermaphroditi vel masculi, albi; pedicelli 1–2 cm. longi, longe laxiuscule sericeo-pilosi vel subvillosi. *Sepala* exteriora herbacea, viridia, obovato-oblonga, acuta, mucronulata, 4–5 mm. longa, interiora submembranacea, flavescentia, exterioribus semper longiora, ovata, mucronato-acuminata, omnia extra pilis albis instructa, interiora intus apicem versus villosula. *Petala* obovata vel suborbiculata, 7–9 mm. longa. *Stamina* petalis dimidio breviora. *Ovarium* pilis longis densissime tectum. *Stylus* claviculiformis, vel crassiuscule filiformis. *Stigma* subcapitatum.—*P. Veitchii*, E. H. Wilson in Gard. Chron., 1911, vol. l. p. 102. *P. fruticosa*, var. *Veitchii*, Bean, Trees and Shrubs, vol. ii. p. 222.—E. M. Jesson.

The subject of our plate is one of the most attractive and, from the cultural standpoint, one of the most distinct of the various shrubby Potentillas added to our collections in recent years. It is a native of upland thickets in Szechuan and Western Hupeh at elevations of over 6000 feet above sea-level, and was introduced from this area by Messrs. J. Veitch and Sons through their collector, Mr. E. H. Wilson, in 1900. It flowered under cultivation for the first time in their nursery at Coombe Wood in 1902. In 1907 Mr. Wilson sent plants from the Arnold Arboretum on behalf of Professor Sargent, and in 1911 he treated the plant as a distinct species, *P. Veitchii*. In 1912 another plant raised from

Northern Chinese seed was received at Kew under the same name from the Arnold Arboretum. This flowered in the hardy collection here in 1914 and from it the material for our plate has been obtained. This plant differs from the one from Western Hupeh in having less hairy leaves with less prominent lateral veins, somewhat smaller outer sepals and petals, and a rather longer style more attenuated towards the base. In other respects the two plants agree. But while sufficiently distinct as a garden-plant, there is little doubt that the form here figured must be looked upon as one intermediate between *P. fruticosa*, Linn., and *P. davurica*, Nestl. Several such forms with whitish or pale sulphur-coloured flowers are known from Eastern Siberia and Manchuria, where the areas of these two species overlap; they appear to correspond with the different variations referred to the reputed garden hybrid, *P. Friedrichsenii*, Späth. Our plant has indeed already been referred as a variety to *P. fruticosa* by Mr. Bean in his excellent work on "Trees and Shrubs Hardy in the British Isles," and that it must be accorded treatment of this kind is indisputable. Perhaps, however, it is on the whole preferable to reduce it to the other species of the pair, *P. davurica*, a plant well known in cultivation and figured at t. 3676 of this work as *P. glabra*, Lodd., which has leaflets that, even in bud, are glabrous except for a few hairs along the margins, and is in its native country a dwarf compact shrub. There are other distinct varieties of *P. davurica*: one with a dense and shaggy tomentum from Manchuria has been distinguished under *P. fruticosa*, not under its proper species, as var. *mandshurica*, Maxim.; another with silvery leaves occurs in Western China. *P. davurica*, var. *Veitchii*, in its native country affects open, rocky situations, fully exposed to the sun. Mr. Wilson describes it as being remarkably floriferous: though at its best in early summer, it flowers continuously from May till late autumn, producing its sprays of snow-white flowers well above the grey-green foliage. In cultivation it makes a shapely low bush and flowers continuously from May until September. It likes a loamy soil and an open, sunny position, and may be propagated by cuttings made in July and August.

Description.—*Shrub*, evergreen, 3–5 ft. high; stems and branches woody, the younger more or less silky, the older sparingly hairy, the bark flaking. *Leaves* $\frac{2}{3}$–1 in. long, 3 5-foliolate; petiole pubescent, $\frac{1}{5}$–$\frac{1}{2}$ in. long; leaflets sessile, obovate-oblong or oblanceolate, mucronulate, entire, $\frac{1}{4}$–$\frac{2}{3}$ in. long, $\frac{1}{7}$–$\frac{1}{3}$ in. wide, green above, paler beneath, adpressed silky or in the cultivated plant sparingly hairy on both surfaces, lateral nerves more or less raised beneath; stipules ovate, acuminate, $\frac{1}{4}$ in. long, scarious. *Flowers* usually solitary at the ends of short one- to few-leaved twigs, occasionally accompanied by a second nearly terminal flower, hermaphrodite or male, white; pedicels $\frac{1}{3}$–$\frac{3}{4}$ in. long, rather loosely silky or almost villous with long hairs. *Sepals*: outer herbaceous, green, obovate-oblong, acute, mucronulate, $\frac{1}{6}$–$\frac{1}{5}$ in. long; inner almost membranous, yellowish, always longer than the outer, ovate, mucronately acuminate; all beset with white hairs outside, and somewhat villous towards the apex within. *Petals* obovate or suborbicular, about $\frac{1}{5}$ in. long. *Stamens* half as long as the petals. *Ovary* densely clothed with long hairs. *Style* clavicular or almost filiform. *Stigma* somewhat capitate.

Fig. 1, leaf and stipules; 2, vertical section of a flower, the petals removed; 3 and 4, stamens; 5, carpel; 6, style:—*all enlarged.*

Tab. 8638.

FATSIA japonica.

Japan.

Araliaceae. Tribe Panaceae.

Fatsia, *Dcne et Planch.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 939.

Fatsia japonica, *Dcne et Planch. in Rev. Hort.* 1854, p. 105; *Ill. Hort.* vol. xvii. p. 116, t. 22 (var. *aureo-reticulata*, Verschaf.); *Franch. et Sav. Enum. Pl. Jap.* vol. i. p. 194; *Trans. Russ. Hort. Soc.* 1863, p. 288, t. 146; *Regel, Gartenfl.* 1863, p. 371, t. 420; *Shirasawa, Ic. Jap.* vol. ii. t. 57, fig. 1–14; a *F. papyrifera*, Benth. et Hook. f., paniculis puberulis (nec tomentosis), capitulis majoribus et floribus saepissime pentameris differt.

Frutex 1–4-metralis, inermis; caulis teres, inermis, foliatus. *Folia* petiolata, 7–9-loba, 12–30 cm. diametro, glabra, lobulis elliptico-lanceolatis vel oblongis acuminatis serratis; petiolus 10–30 cm. longus, basi latus vel interdum vaginatus. *Inflorescentia* ex umbellis globosis, 2·5–4·5 cm. diametro, pedunculis nonnunquam iterum divisis 2–10 cm. longis suffultis in paniculas compactas dispositis composita; rhachis et pedunculi puberuli; bracteae lanceolatae, acutae, reflexae. *Flores* saepissime pentameri, albo-virides; pedicelli circiter 1 cm. longi, minute puberuli. *Calyx* campanulatus, 5-costatus, 2·5 mm. longus, lobi obsoletes. *Petala* subpatentia, ovata, apice apiculata, incurva et subsaccata, medio carinata, 3 mm. longa. *Filamenta* glabra, circiter 4 mm. longa; antherae late oblongae, 1·5 mm. longae. *Discus* convexus, verrucosus, 3–5 mm. latus; styli 5, erecti, glabri, 1 mm. longi, apice vix incrassati. *Fructus* globosus, 0·7–0·8 cm. diametro. —*Aralia japonica*, Thunb. Fl. Jap. p. 128; DC. Prodr. vol. iv. p. 258; Sieb. et De Vriese, Fl. Jard. Pays-Bas, 1858, p. 25, t. 2. *A. Sieboldii*, C. Koch, Dendrol. vol. i. p. 678.—R. A. Rolfe.

The interesting Japanese Araliad now figured has long been known to European cultivators. It is the original *Aralia japonica* of Thunberg, but was separated from the genus *Aralia* by Decaisne and Planchon, when these authors revised the *Araliaceae*, because of its different floral structure. The name *Fatsia*, given by them to the newly established genus, was bestowed owing its being believed that the native name of our plant is Fatsi. It is not certain, however, that this is the case; according to Franchet and Savatier, the Japanese name is more correctly written Iats'de. These latter authors included in the genus a second species, *F. horrida*, which is, however, better referred to *Echino-*

panax, Dcne & Planch., and has for this reason been figured as *F. horridus* at t. 8572 of this work. Another species was added to the genus by Bentham and Hooker as *F. papyrifera*; this species, which has with justice been transferred by C. Koch to the genus *Tetrapanax*, has also found a place at t. 4697 of this work under its older name *Aralia papyrifera*, Hook. The plant now figured, which is thus the sole representative of its genus, though a common feature in collections for over sixty years, has chiefly been in use as a decorative plant in conservatories. It is, however, hardy in the average climate of Great Britain if it be given a sheltered situation. Plants put out in 1891 have succeeded well in the Bamboo Garden at Kew, and although they suffered somewhat from the great frosts of February, 1895, they were not destroyed, and that has been the only occasion on which they appear to have been affected by cold. At the same time this shrub is to be seen at its very best in the gardens of our southern and western counties. Flowering, as it does, in late autumn, its huge panicles produce a particularly striking effect in October and November, when there are few other plants in blossom. If *F. japonica* can be afforded a position which is sheltered from the sun during the middle of the day, it does better than in more exposed situations. It likes a loamy soil, and is increased by placing cuttings of a fairly firm growth singly in pots plunged in a mildly heated propagating frame.

DESCRIPTION.—*Shrub*, 3–13 ft. high, unarmed; stem terete, without prickles, leafy. *Leaves* petioled, 7–9-lobed, 5–12 in. wide, glabrous; lobes elliptic-lanceolate or oblong, acuminate, serrate; petiole 4–12 in. long, base expanded and at times sheathing. *Inflorescence* a compact panicle of globose umbels, each umbel 1–1$\frac{3}{4}$ in. across, with a peduncle, occasionally again branched, $\frac{3}{4}$–4 in. long; rachis and peduncles puberulous; bracts lanceolate, acute, reflexed. *Flowers* usually 5-merous, greenish-white; pedicels about $\frac{1}{3}$ in. long, finely puberulous. *Calyx* campanulate, 5-ribbed, $\frac{1}{10}$ in. long, the lobes obsolete. *Petals* somewhat spreading, ovate, apiculate incurved and slightly saccate at the tip, keeled

along the middle, $\frac{1}{8}$ in. long. *Filaments* glabrous, about $\frac{1}{6}$ in. long; anthers wide-oblong, $\frac{1}{16}$ in. long. *Disk* convex, verrucose, $\frac{1}{8}$–$\frac{1}{5}$ in. wide; styles 5, erect, glabrous, very short and very slightly thickened at the tip. *Fruit* globose, about $\frac{1}{3}$ in. across.

Fig. 1, bract; 2, flower-bud; 3, an expanded flower; 4 and 5, stamens seen from the side and from behind; 6, ovary and styles:—*all enlarged.*

M.S del. J.N.Fitch lith.

Vincent Brooks Day & Son Ltd imp.

L. Reeve & Co. London.

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp.

L. Reeve & Co London

Tab. 8639.

EUONYMUS oxyphyllus.

Japan and Corea.

Celastraceae. Tribe Celastreae.

Euonymus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 360.

Euonymus oxyphyllus, *Miq. in Ann. Mus. Bot. Lugd.-Bat.* vol. ii. p. 86; *Maxim. Mél. Biol.* vol. xi. p. 187; *Hemsl. in Journ. Linn. Soc., Bot.* vol. xxiii. p. 121; *Shirasawa, Ess. For. Jap.* p. 104, t. 64; *Koehne in Mitteil. Deutsch. Dendr. Ges.* 1906, p. 63; ab *E. latifolio*, Scop., cui sub anthesi similis, fructibus haud lobatis distinguitur.

Frutex, vel *arbor* ad 7 m. alta trunco 3 dm. diametro. *Gemmae* hibernae ovoideo-fusiformes, acutae, circiter 0·5 cm. longae. *Rami* patentes; ramuli annotini viridi-brunnei, nitiduli, hornotini herbacei, virides, torsione internodiorum pseudo-distichi. *Folia* ovato-oblonga, acuminata, subacuta, basi rotundata vel obtusa, 4·5–8 cm. longa, 2·5–3·5 cm. lata, tenuiter chartacea, opaca, supra nervo medio leviter elevato venulis indistinctis, subtus pallida nervis et venulis perdistinctis; petioli 3–5 mm. longi. *Dichasia* in axillis foliorum inferiorum ramulorum hornotinorum orta, bis vel ter furcata; pedunculus 3·5–5·5 cm. longus; pedicelli 5–6 mm. longi. *Flores* pentameri, 8–9 mm. diametro. *Calyx* 4·5 mm. diametro; sepala transverse elliptica; petala suborbicularia, luride purpureo-viridia. *Discus* quinquelobus, crassus, viridis. *Stamina* umbonibus disci affixa; filamenta 0·2 mm. longa, basi articulata; antherae in alabastro inflexae, late reniformes, thecis lateralibus apice perfecte confluentibus rima continua dehiscentibus sub anthesi erecti, post dehiscentiam patelliformes, 0·5 mm. diametro. *Ovarium* in disco immersum, 5-loculare; stigma subsessile, capitatum, 0·6 mm. diametro; ovula pro loculo bina, pendula. *Capsula* carminea, depresso-globosa, saepius 3–4-sperma. *Semina* in arillo coccineo apice imbricatim quinquelobato omnino inclusa, circiter 4 mm. longa.—T. A. Sprague.

The Spindle-tree which we figure here is one which appears to be common in Japan and extends into Corea without, however, occurring in China. It has very much the appearance of the European *Euonymus latifolius*, Scop., and in flower might be mistaken for that plant. Its fruits differ, however, in being unlobed, and thus serve to distinguish it. The plant of *E. oxyphyllus* from which the material for our plate has been obtained was received at Kew from the Arnold Arboretum in 1895. It is perfectly hardy and thrives well in a loamy soil. Like its European ally it is a small tree, at present eight to ten feet in height, very graceful in habit and extremely

attractive in September, when its branches are laden with brilliantly coloured fruits pendulous on long slender stalks. Each seed is completely enveloped in a fleshy scarlet imbricately five-lobed arillus. These seeds are produced in abundance and render its propagation easy.

DESCRIPTION.—*Shrub* or small *tree*, in the wild state reaching 25 ft. in height with a trunk 1 ft. in diameter; winter-buds ovoid-fusiform, acute, about $\frac{1}{5}$ in. long; branches spreading; twigs of the previous season greenish-brown, polished; of the present season herbaceous, green. *Leaves* assuming a distichous position from a twisting of the internodes, ovate-oblong, acuminate, subacute, rounded or almost truncate at the base, $1\frac{3}{4}$–3 in. long, 1–$1\frac{1}{2}$ in. wide, thinly papery, dull, midrib slightly raised above, venation indistinct, paler beneath with nerves and venation very distinct; petiole $\frac{1}{8}$–$\frac{1}{5}$ in. long. *Dichasia* 2–3 times forked, arising in the axils of the lower leaves of the shoots of the previous year; peduncle $1\frac{1}{2}$–$2\frac{1}{4}$ in. long; pedicels $\frac{1}{5}$–$\frac{1}{4}$ in. long. *Flowers* 5-merous, about $\frac{1}{3}$ in. across. *Calyx* $\frac{1}{6}$ in. across; sepals transversely elliptic. *Petals* suborbicular, greenish-purple. *Disk* 5-lobed, thick, green. *Stamens* attached to the disk-lobes; filaments $\frac{1}{12}$ in. long, jointed at the base; anther inflexed in bud, wide reniform, cells lateral quite confluent at the tip, and opening by a continuous chink; in flower erect, after dehiscing patelliform. *Ovary* sunk in the disk, 5-locular; stigma subsessile, capitate; ovules 2 in each cell, pendulous. *Capsule* carmine, depressed-globose, usually 3–4-seeded. *Seeds* completely enveloped in a scarlet arillus which is imbricately 5-lobed at the tip, about $\frac{1}{6}$ in. long.

Fig. 1, flower-bud; 2, flower from which the anthers have fallen; 3, stamen; 4, longitudinal section of a flower; 5, seed enclosed in its arillus; 6, the same, with arillus laid open; 7, the same, with arillus removed:—*all enlarged.*

M.S.del. J.N.Fitch.lith.

Vincent Brooks, Day & Son Lith.

L. Reeve & Co. London.

Tab. 8640.

IRIS bracteata.

Oregon.

Iridaceae. Tribe Irideae.

Iris, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 686.

Iris bracteata, *S. Watson in Proc. Amer. Acad.* vol. xx. (1885), p. 375 et *in Garden and Forest*, 1888, p. 43, fig. 8; *Dykes in Gard. Chron.* 1912, vol. lii. p. 338, fig. 148, et *Genus Iris*, p. 38; affinis *I. Purdyi*, Eastw., sed pedicello longo, perianthii tubo brevi infundibuliformi, foliis cum quoque turione paucioribus distincta.

Herba rhizomate gracili oblique descendente cataphyllorum residuis induratis dense obtecto. *Turiones* foliigeri basi cataphyllis firmis brunneis imbricatis ovatis vel oblongis acutis tecti. *Folia* circiter 4, quorum duo valde abbreviata, fere tota longitudine vaginantia, tertium praecedente fere duplo longius ad $\frac{2}{3}$ vaginans, summum ad 40 cm. longum non nisi ima basi vaginans, exteriora basi purpurascentia, caeterum viridia, omnia linearia acuta, majora ad 8–9 mm. lata, uno latere viridia, altero subglauca vel paulo pallidiora laevia, nervis tenuibus prominentibus primariis circiter 8–10. *Caules* florentes ad spatharum bases 10–15 cm. alti, basi cataphyllis more turiorum obtecti; cataphylla in folia ad vaginas 4–8 cm. longas redacta circiter 3 abeuntia. *Spathae* lanceolatae, acuminatae, 5–6 cm. longae, virides, anguste membranaceo-marginatae, tenuiter carinatae. *Flores* 2; pedicelli 4–5 cm. longi. *Perigonii* tubus infundibuliformis, 5–6 mm. longus; segmenta exteriora limbo oblongo-ovato patulo 3·5 cm. longo 2 cm. lato luteo nervis 4 brunneo-purpureis exterioribus marginem versus venas eodem colore emittentibus eximie ornato sensim in unguem latiusculum 1·5 cm. longum abeunte; segmenta interiora erecta, limbo oblongo obtuso, in unguem angustum attenuata, tota lutea. *Antherae* luteae, 14 mm. longae; filamenta brevia, pilosula. *Ovarium* oblongum, 1–1·5 cm. longum; styli rami lati, lineares, crista majuscula subquadrata, lobis subcrenulatis; stigma late triangulare. *Capsula* oblonga, teres. *Semina* cubico-cuneata. —O. Stapf.

The subject of our plate, *Iris bracteata*, has been in cultivation in the Iris Collection at Kew for a considerable number of years, and the material for our figure has been obtained from one of the oldest plants therein. The species was discovered in 1884 by Mr. T. Howell, of Arthur, Oregon, in the Walds and Dear Greek Mountains of Josephine County close to the southern boundary of the state, where it flowers in the latter part of April and in May. Under the cultural treatment suitable for most species of *Iris* it thrives well in this country, flowering a fortnight later than it does in its native habitat.

According to Mr. S. Watson, the veining of the falls, so marked a feature in the plants grown in England, is not a constant character, while Mr. Dykes in his monograph of the genus *Iris* points out that under cultivation in this country, various colour varieties or hybrids have appeared in which the yellow of the flowers in the wild plant has been replaced by red, almost crimson; in this case, however, the veining has persisted. Owing to the laxly branched rhizome *I. bracteata* is of somewhat scanty growth, the leaf-tufts and flowering stems coming up in a scattered fashion. The lowermost leaves just above the scales are reduced to the sheathing portion and only one, or occasionally perhaps two of the leaves belonging to a tuft are of the normal *Iris* type. Mr. S. Watson has pointed out that the stomata of the leaves are in this species confined to the pale side of the leaf.

Description.—*Herb*, with a slender branching obliquely descending rootstock which is closely covered by the hardened remains of the firm bud-scales; leafy tufts clothed at the base by fresh firm brown imbricate scales. *Leaves* about four to each tuft, usually only one fully developed; the two outermost very much reduced and sheathing almost throughout, the third about twice as long as the basal, sheathing for two-thirds of its length, the uppermost fully developed leaf sheathing at the base only and reaching $1\frac{1}{3}$–$1\frac{1}{2}$ ft. in length; all linear, acute, the larger about $\frac{1}{3}$ in. wide, all green on one side, paler green or somewhat glaucous on the other, main-nerves about 8–10, slender but distinct. *Stems* with flowers 4–6 in. high to the bases of the spathes, clothed below with scales like those of the leafy tufts, the uppermost scales passing into leaves, usually 3 in number, which are reduced to sheaths $1\frac{1}{2}$–3 in. long. *Spathes* lanceolate, acuminate, 2–$2\frac{1}{4}$ in. long, green, with thin membranous margins, slightly keeled along the centre behind. *Flowers* 2; pedicels $1\frac{3}{4}$–2 in. long. *Perianth* with a funnel-shaped tube 2–$2\frac{1}{4}$ in. long; outer segments with an oblong-ovate, spreading limb about $1\frac{1}{2}$ in. long and $\frac{3}{4}$ in. wide gradually narrowed to a wide claw about $\frac{2}{3}$ in. long, yellow with 4 brownish-purple, longitudinal veins of which the outer pair give off numerous lateral branches

of the same colour that pass obliquely outwards to near the margin; inner segments erect, limb oblong, obtuse, contracted to a narrow claw, uniformly yellow. *Anthers* yellow, over $\frac{1}{2}$ in. long; filaments short, slightly hairy. *Ovary* oblong, $\frac{1}{3}$–$\frac{2}{3}$ in. long; style-arms broad, linear, with a distinct subquadrate crest and crenulate lobes; stigma wide-triangular. *Capsule* oblong, terete. *Seeds* somewhat cubical, cuneate.

Fig. 1 and 2, stamens; 3, stigma:—*all enlarged.*

M S del J.N F. ch. lith.

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Tab. 8641.

PRUNUS Maximowiczii.

North-eastern Asia.

Rosaceae. Tribe Pruneae.

Prunus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 609.

Prunus Maximowiczii, *Rupr. in Bull. Acad. Pétersb.* vol. xv. p. 131 (1857); *Sargent in Gard. and For.* vol. vi. fig. 31, et *For. Fl. Jap.* t. 12; *C. K. Schneider in Handb. der Laubholzk.* vol. i. p. 620; *Shirasawa, Ic. Jap.* vol. ii. t. 30, figs. 1–9; *Bean, Trees and Shrubs*, vol. ii. p. 243; species e grege *Mahaleb* ob bracteas foliaceas insignis *P. szechuanicae*, Batalin, proxime accedens sed inflorescentia nequaquam umbelliforme pedunculo elongato pedicellis brevioribus bracteis inconspicue glandulosis apte distinguenda.

Arbor 6–9-metralis, coma patula, ramulis hornotinis pallide hirsutis annotinis glabrescentibus cinereo-fuscis. *Folia* ovata, elliptica vel obovata, acuminata, basi cuneata vel rotundata, margine irregulariter duplo-serrata, 3·5–10 cm. longa, 2–3·5 cm. lata, opaca, supra glabra vel parce pubescentia, subtus pubescentia praesertim secus costam nervosque; petiolus villosus, eglandulosus, 0·6–1·4 cm. longus; stipulae lineares, serratae, pubescentes, 6–8 mm. longae. *Racemi* corymbosi, 2·5–5 cm. lati, saepius 5–8-flori, in ramulos foliaceos abbreviatos insidentes; bracteae conspicuae, foliaceae, concavae, rotundatae vel ovatae, serratae, nonnunquam glandulosae, plus minusve pubescentes, 6–9 mm. longae; pedunculi villosi, 0·6–1·8 cm. longi. *Flores* 1·2–1·5 cm. lati. *Calyx* villosus, basi campanulatus, 5-lobus; lobi glanduloso-serrati, 3 mm. longi. *Petala* 5, concava, orbicularia, 6 mm. lata, primum alba, demum puniceo-suffusa. *Stamina* numerosa; antherae luteae. *Ovarium* ovoideum, glabrum; stylus gracilis; stigma capitatum. *Fructus* globosus, nitidus, suberectus, primum ruber, demum niger, 0·6 cm. latus.—W. J. Bean.

Prunus Maximowiczii belongs to the *Mahaleb* section of the cherries, but is distinguished from the other cultivated species of that group by the conspicuous foliaceous bracts on the inflorescence. It is closely allied to *P. szechuanica*, Batalin, a species probably not in cultivation, which differs by its subumbellate inflorescence, its much shorter peduncle but longer pedicels and by its conspicuously glandular bracts very villous beneath. Originally discovered in Eastern Manchuria and described by Ruprecht in 1857, *P. Maximowiczii* has since been found in Japan, Sachalin and Corea. It did not reach this country until 1895 when it was sent to Kew by Prof. Sargent from the Arnold Arboretum, to which establish-

ment he had introduced it from Japan three years previously. It has succeeded very well and proved to be quite hardy, forming a small tree of neat shape. The material used in the preparation of our plate was kindly supplied by Mr. T. Smith from his well known nursery at Newry, where the tree apparently bears fruit more freely than it does at Kew. There is some variation in the degree of pubescence on the leaves. On Mr. Smith's plant it is almost confined to the midrib and veins beneath, but on one grown in the Kew collection the leaves are softly villous beneath. The glands on the teeth of the bracts and calyx-lobes also vary in their frequency and size. The foliage of this cherry turns a fine red colour before falling in both Japan and North America, but, owing probably to our duller skies, has not shown this quality with us.

DESCRIPTION.—*Tree*, 20–30 ft. high, of spreading habit, young shoots clothed with pale hairs the first season, glabrescent and greyish-brown the second. *Leaves* ovate, oval, or obovate, cuneate to rounded at the base, shortly acuminate, irregularly and doubly serrate; $1\frac{1}{2}$–4 in. long, $\frac{3}{4}$–$1\frac{5}{8}$ in. wide; dull green, glabrous or slightly pubescent above, pubescent beneath especially on the midrib and veins; petiole villous, eglandular, $\frac{1}{4}$–$\frac{5}{8}$ in. long; stipules linear, serrate, $\frac{1}{4}$–$\frac{1}{3}$ in. long, pubescent. *Racemes* corymbose, 1–2 in. wide, usually 5–8-flowered, produced on short leafy shoots. *Bracts* conspicuous, foliaceous, concave, roundish to ovate, serrate, sometimes glandular, pubescent (sometimes slightly), $\frac{1}{4}$–$\frac{3}{8}$ in. long. *Peduncle* and pedicels villous, the latter up to $\frac{3}{4}$ in. long. *Flowers* $\frac{1}{2}$–$\frac{5}{8}$ in. wide, opening in May. *Calyx* villous, with a campanulate base and five lanceolate, glandular-serrate lobes $\frac{1}{8}$ in. long. *Petals* 5, concave, orbicular, $\frac{1}{4}$ in. wide, at first white, becoming pinkish before falling. *Stamens* numerous, anthers yellow; ovary and style glabrous. *Fruit* globose, $\frac{1}{4}$ in. wide, shining, at first red, then black, more or less erect.

Fig. 1, flower and bract, the petals removed; 2 and 3, stamens; 4, pistil; 5, young fruit; 6, stone of ripe fruit:—*all enlarged.*

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